AMERICAN GAS ASSOCIATION MONTHLY

Hello—London Calling Atlantic City
AN EDITORIAL

Greetings from Across the Atlantic
By SIR DAVID MILNE-WATSON

Economic Aspects of Natural Gas Projects
By THOS. R. WEYMOUTH

The Key to Coal's Treasure Chest
By C. J. RAMSBURG

Modern Salesmanship Defined
By FRANCIS W. GOODENOUGH

A Time- and Labor-Saving Card File System for Gas Meter Records
By JOHN L. CONOVER

Gas Modernizes the Forge Furnace
By J. B. NEALEY

December, 1929

Volume XI
Number 12

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American Gas Association
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AMERICAN GAS ASSOCIATION MONTHLY

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This issue of the MONTHLY is dedicated to Sir David Milne-Watson, author of the inspiring address that was sent to the A. G. A. Convention by trans-oceanic telephone.

—The Editor.

The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein.

Published Monthly by the
AMERICAN GAS ASSOCIATION
420 Lexington Avenue,
New York, N. Y.

Entered as Second Class Matter at the Post Office at Brattleboro, Vermont, February 10th, 1922, under the Act of March 3, 1879.

Subscription Rate $3.00 a Year

Our Own Who's Who

LV

H. C. COOPER

PRACTICALLY all of Mr. Cooper's business life has been spent in the gas and oil industry. In the early days he superintended the construction of an oil pipe line through New York and Pennsylvania and another in Indiana. In 1910 he joined the Hope Natural Gas Co., and Peoples Natural Gas Co., at Pittsburgh, as engineer. In 1912 he went to Clarksburg, W. Va., as general superintendent for the Hope Natural Gas Co., and in 1918, he was appointed chief engineer for the group of companies which includes Hope Natural, Peoples Natural, Reserve Gas Co., Hope Construction & Refining Co., Connecting Gas Co., and Marion Oil Co., with offices at Pittsburgh.

Mr. Cooper is considered an authority on gas and oil engineering and he has contributed many valuable papers on these subjects. For several years he has been chairman and leading personality of the Technical and Research Committee of the Natural Gas Department. He is now vice-chairman of the Department.

As consulting engineer, he has been connected with the Standard Oil Company of New Jersey in such projects as the construction of large capacity, long-distance pipe lines. One of the first of these transmission lines was laid from the Monroe field to Baton Rouge, Louisiana, in 1926. In 1927 Mr. Cooper's services were employed in running the large pipe line from Amarillo, Texas, to Denver, Colorado. He is now engaged in the construction of a line to bring gas from the Louisiana fields to the city of St. Louis—a distance of around 450 miles.

AMERICAN GAS ASSOCIATION MONTHLY

VOLUME XI DECEMBER, 1929 NUMBER 12

Hello—London Calling Atlantic City

AN EDITORIAL

HISTORY of industry, like history of nations, reveals from time to time events which are of such importance that comment from an editorial desk is futile. Mere type and paper cannot hope to convey the fundamental significance of these happenings.

At the recent A. G. A. convention there was a definite high-spot. Several thousand American gas men crowded into one room to witness this feature, and it is only correct to state that these gas men were as impressed with the significance of the event as they were with the event itself.

This feature was the telephone message from the British gas industry to the American, and was transmitted by the trans-oceanic telephone from London to Atlantic City by Sir David Milne-Watson.

While the event was an important one, in that it represented the perfection of trans-oceanic communication, the significance of the event far outshadows any happening at an A. G. A. convention in recent years. This was more than a telephone feat. It was the culmination of the idea that the America gas industry and the British and Continental gas industries are very close in their ideals and purposes.

The *London Gas Journal* says this editorially as follows:

"What Sir David had to say must have been received with keen appreciation by his hearers; and it will be warmly endorsed by the gas industry on this side. Each must have something to learn from the other; and possibly the direction in which the experience of America is likely to be of use to us is in connection with the building-up of scientific rate structures."

We wish to state that what Sir David had to say was received with keen appreciation by the American gas industry, and that it is only fitting that the industries on both sides of the Atlantic endorse his well-thought-out opinions in a most wholehearted manner.

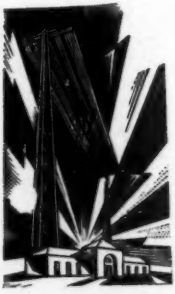
America can prosper and benefit from contact with its cousins across the water. The gas industry in this country is fortunate indeed to have as its leaders capable and efficient men; and it is also fortunate that the sister industries on the other side of the Atlantic have leaders who are just as capable and efficient. We can learn a great deal from our sister industries, and we hope that we have progressed along some lines at least to the point where we can offer them our experiences.

So impressed were the thousands in the great hall that a pin dropped could have been heard as Sir David's address came through, perfectly amplified.

Sir David Milne-Watson telephones his greetings to the A. G. A. convention

Greetings from Across the Atlantic

By SIR DAVID MILNE-WATSON, LL.D., L.D.



I AM very sensible of the honor you have done me in asking me to address you and I heartily welcome the opportunity afforded me of conveying to you in your eleventh annual convention, the fraternal greetings of the members of the National Gas Council of Great Britain and Ireland, of which I have the honor to be president, and of the Gas Light and Coke Co., of which I am the governor, and of conveying to you our best wishes for the success of your convention.

Those familiar, as we all should be, with the wonderful history of gas supply, should not, I suppose, be unduly surprised by the marvellous developments which have been achieved in other spheres, but I confess that I find it difficult to realise that my voice is being heard, and I hope clearly heard, by each of you in the great municipal auditorium in Atlantic City, more than 3000 miles away. It is singularly appropriate, too, that I should be speaking to what is undoubtedly the greatest assemblage of those concerned with the manufacture and supply of gas ever brought together, from the spot where, 117 years ago, gas was first made on a very modest scale and in a very crude way for distribution to the public in London by a small company which has now grown to be, I believe, the largest gas manufacturing company in the world.

These circumstances give an historic and a romantic touch to the occasion, and in addition the directness with which I am privileged to communicate with you produces a feeling of proximity which will, I hope, help me to convey to you the cordiality and sincerity of our sentiments towards you. We,

---

Address delivered via Trans-Oceanic Telephone to the American Gas Association Convention, Atlantic City, N. J., Oct. 16, 1929.

Sir David is Governor of the Gas Light and Coke Co., London, England

on this side of the Atlantic, have had many proofs of your kindly interest.

I recall with pleasure my all-too-brief visit to the United States last winter when I had the privilege of visiting the offices and works of the Consolidated Gas Company of New York. I was greatly impressed by all I saw and heard, but what impressed me more than anything else was the warm welcome I received from all those with whom I came in contact, and the willingness with which I was supplied with the information I was seeking.

I recall, too, visits paid by others connected with the gas industry of this country, from which they returned filled with admiration for American gas practice, and for the way in which every facility was afforded to them, both by the officials of your association and by the representatives of constituent members in all parts of the States, for obtaining knowledge of your methods in the most thorough and expeditious manner.

From time to time, too, we have had the pleasure of welcoming over here your president and other members of your association. Samuel Insull is a frequent visitor, and I am always delighted to meet him and others who come across to see the conditions we have to encounter on this side and how we seek to meet them.

I sincerely hope that these visits will be multiplied, and the interchange of ideas extended, not only because they are of mutual advantage to us in our work, but also because they tend to strengthen the bonds between our two great nations. We hear much in these days of the great importance of a complete and harmonious understanding between the English-speaking peoples of the world, and there are few who do not anxiously desire to see that ideal attained.

We have been following with intense interest the conversations to that end which have been proceeding between the President of the United States of America, and the Prime Minister of this country. Complete understanding can, however, be reached only if there is good will and understanding between individuals and groups of individuals like ourselves, whose common interests, aims and aspirations bring us into touch. Apart, altogether, therefore, from our obligations to the constituent members of our respective associations and to the public whom we serve, we have a duty to the world at large, and as the performance of that duty is in my experience, and I hope in yours, both profitable and pleasurable, there is an overwhelming case not only for the maintenance but also for the intensification of our business and social relationships.

Another note which I wish to strike in my message to you from the gas industry of Great Britain is one of congratulation. Congratulations not only because you are holding the greatest meeting of gas men and the greatest exhibition of gas appliances and equipment which have ever been held, but also because of all that the meeting and the exhibition imply. They are outward and visible signs of the enormous magnitude of the industry which you have built up, of the vast territory to which it extends, and of the efficiency and skill with which the manifold and ever-changing needs of millions have been met by the use of gas.

They indicate the tremendous financial strength of your industry and the leading role which it plays among the industries of the United States of America.

They constitute a triumph of organization and here a special tribute must be paid to those who conceived the idea of a large central organization and have been responsible for creating and carrying on with such conspicuous success the American Gas Association, and to Managing Director Alexander Forward and the other officials of the association whose multifarious and indispensable duties include the organizing of your great annual conventions.

Above all, your meeting and your exhibition connote that there is to be no standing still in the gas industry of the United States. The triumphs of the past are but stepping stones to future achievements. The program of your convention breathes that spirit of progress and development which has already found expression in your association's far-famed research laboratory, and I feel sure that we shall soon see its fruits in the

further perfecting of existing practice in many directions and in the successful occupation of new fields of usefulness and profit.

We have watched with admiration the growth of the industrial gas load to its present vast dimensions, as we are studying with the greatest interest the revolution which you have effected in the application of gas to your house heating problems, resulting in the elimination of dirt, labor and noise, the setting free of valuable space, and the establishment of a still higher level of domestic comfort.

The great advance which you have made in these two independent spheres is doubtless the reward of the careful attention which you have given to the problems of rate structure. We, too, have been studying these same problems, and when some necessary legislative changes have been effected, we expect to find that our conditions will call for a solution somewhat similar to yours.

Both upon your past and present achievements and upon the promise of those to come, I therefore offer you our warmest congratulations.

The problems and difficulties which face gas undertakings in different countries necessarily vary with national and local conditions. Legislation, distribution of population, economic, industrial, climatic and geographical conditions, natural resources and other factors play an important part.

The main purpose of gas undertakings, wherever they may be situated, is, however, the same. It is to give the best possible service to the greatest number of people, for the largest number of purposes for which gas can be used, at the cheapest possible rates. That that purpose has been and is being achieved is shown by the fact that, despite competition—keener than ever before, both in respect of our primary product and our by-products—the use of gas is steadily increasing. The figures speak for themselves.

I see that in the United States the percentage increase in the use of manufactured gas during the year 1928 was 3.8, while it is estimated that there was approximately a 10 per cent increase in the use of natural gas. The amount sold of the former was four hundred and ninety thousand million cubic feet and of the latter sixteen hundred million million cubic feet were produced. These are stupendous figures—those for natural gas eclipsing all previous records—and they amply justify the claim that gas leads "fuel growth" in America. I am glad to be able to tell you that we, on this side, can also look back on 1928 with satisfaction, and the present year will probably create new records.

We belong to a powerful, healthy and progressive industry, possessing a history of which we all have reason to be proud. And if, as we develop our heritage, others from time to time cast envious eyes upon it, and even seek to enter it, we should have no difficulty in resisting them, for our vitality and aptitude for service have never been greater than they are today.

The last note, therefore, which I wish to strike is one of hope and confidence in the future of the gas industry of the United States and here. Prospects are bright and their development being in the hands of men who have proved their worth in every sphere which the gas supply service embraces is assured. I have one regret, and that is that I am not *one of the lucky 6000* assembled in Atlantic City, but I am proud to think that you have had the Atlantic narrowed so that I could speak to you and express to you by word of mouth the hearty greetings and good wishes of the gas industry of Great Britain.

The Consumers Gas Co. at Toronto ties in with the Industrial Gas Section's outdoor advertising program

Gas Modernizes the Forge Furnace

By J. B. NEALEY

This is the second of a series of articles that Mr. Nealey is preparing on the utilization of gas for industrial purposes. The first article, "The Real Facts of Industrial Utilization," appeared in the October issue. The author is presenting in this series the latest available data and information, and it is apparent that the articles will prove of exceptional value to the industrial gas man. The next article will appear in the January issue.

FORGING is one of the oldest in age, most widespread in use, and fundamental in effect of all the metallurgical operations. Yet at the same time it is probably the least advanced of the sciences. There has been a constant and pressing need for refinement in the methods of applying heat in this process for years for it is a well-known fact that out of every dollar of fuel purchased by the average forge shop today, less than five cents' worth is actually and effectively utilized.

At least this was true of most shops up until two or three years ago when the gas industry started to study the situation and to provide a remedy by developing efficient and economic furnaces.

In this study a careful analysis of the forging process, the physical and metallurgical changes effected, etc., disclosed three vital factors that must be provided for in the design of an improved type of forging furnace. These were, first, a longer heating period; second, a controlled atmosphere within the heating chamber; and third, greater production.

In heating metal preparatory to forging, the tendency has been to bring the stock up to forging temperature too quickly, and without thought of heat penetration. With this practice the outer part flows readily under the hammer while the core is but slightly affected, as it is still too cool. Thus a forging is produced which is dissimilar in composition.

Thus the refinement of grain structure is entirely overlooked and yet it is one of the most important factors in modern forging practice. In order to produce a forging of similar composition throughout and with a uniform grain structure, it was found necessary to heat the stock up to forging temperature and then to equalize the heat throughout its entire cross section by prolonging the heating period. Lengthening the furnace to afford a predetermined time element for soaking solved this problem. In this way forgings with a primary grain structure suitable for subsequent heat treatment (normalizing, hardening, drawing, etc.) were produced.

The matter of burning the steel stock gave much concern, for if steel is heated too hot it will fracture during forging or fail later on because it is coarse and brittle. As the prevailing tendency is to forge at high temperatures, burning was minimized by adding automatic temperature controls to the forging furnace to maintain a predetermined heat without fluctuation. Further to insure against burning a mechanical pusher was also added to the equipment of the furnace, and when actuated with a time clock each piece of stock remained in the furnace the correct length of time and was then automatically discharged.

A view of a forge shop where all furnaces use gas fuel

One of the worst factors the forge shop has to contend with is scalding or oxidizing. The fact that 30 per cent of the cost of machining is due to scale, in or on the forging, serves to accentuate this point. The only way to reduce scaling is by controlling the atmosphere within the furnace and this is accomplished by using gas fuel and equipping the firing system with a means for proportioning the gas-air mixture in any desired ratio, by the use of which is produced an oxidizing, neutral, or reducing atmosphere. The latter is necessary to minimize scaling. This control is just as easily applied to small furnaces of the periodic type.

Higher production was accomplished partly by the lengthening of the furnace, which increased its capacity, and by making it continuous and automatic in operation, which minimized the delays of charging and increased the numbers of pieces continuously available to the forging crew. Stock is pushed in by means of a mechanical pusher and the length of the heating cycle is controlled by operating the pusher with a time clock. On some furnaces the pusher is actuated with motor and cam and the heating cycle regulated through a train of speed reduction gears.

In other words, the forging furnace of today is an automatic heating machine built for mass production and is fired with gas fuel. The rate at which these machines are being adopted throughout industry is amazing. The economies effected by them are considerable and, among others, include reduction in wastage, labor, space, fuel, etc.

Recently the American Gas Association launched a program of research to ascertain the cause of burning and its remedy together with a study of the conditions affecting burning and the underlying causes of this behavior of steel. The effect of oxidizing and reducing atmospheres on steels heated for forging was studied and the results given. While this research has not yet been concluded, some interesting observations have been made.

This research is being conducted by W. E. Jominy, who is associated with the engineering research department of the University of Michigan.

To summarize briefly the results of the experimental work, the following conclusions may be stated:

1. The word "burning" as used in the industry is not a good word, since it implies chemical reaction of the steel with oxygen. This reaction is not necessary to produce so-called "burning." In practically every case which the writer has observed there have been voids around the crystal boundaries of "burned" metal. In this work steel was always considered burned when it contained voids which followed the crystal boundaries.

Automatic and continuous gas forging furnace for billet heating

2. A reducing atmosphere seems to protect plain carbon steels having a carbon content of 0.55 per cent or less from burning. If the atmosphere is reducing enough to produce carburization, these steels will not burn. This is not true of high carbon steels containing 0.85 per cent carbon or more.

3. A turbulent, strongly oxidizing atmosphere will cause these lower carbon steels to burn at relatively low furnace temperatures; a 0.47 per cent carbon steel will burn at 2500° F. in such an atmosphere.

4. When heated in a turbulent, strongly oxidizing atmosphere to furnace temperatures of 2500° F. or higher, plain carbon steels actually become hotter than the furnace atmosphere in which they are heated.

5. The burning of steel has been found to occur in a vacuum; that is, voids between crystals are produced, probably due to the fact that the crystal boundaries melt out at these temperatures.

The following table shows the temperature at which the various steels investigated will burn if forged immediately after heating in a direct fired gas furnace when using a large excess of gas, and a large excess of air:

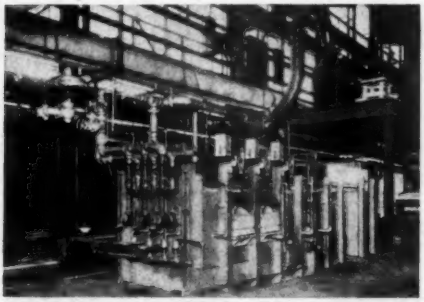
If the atmosphere in which the steel is heated is sufficiently oxidizing and turbulent, the steel becomes hotter than the furnace atmosphere by reason of the exothermic reaction between iron and oxygen. If this reaction proceeds fast enough heat is generated faster than can be taken away by the surrounding atmosphere and then the piece becomes hotter than the atmosphere. Due to that reaction the steels in the above table may burn in furnace atmospheres whose temperature is lower than that given for oxidizing conditions.

The greatest danger about burning is the fact that in many cases the steel may appear quite satisfactory on the surface while the center may be in very poor condition. There are no means of determining whether a specimen is burned except by sectioning the piece. Hence it is apparent that there is no effective commercial method of inspection sufficiently reliable to detect all burned forgings.

It has been shown that a piece of steel which has been burned may be forged and that further by forging at a welding heat many of the voids may be welded up. However, even when there are no oxides it is not possible to be sure of welding all the voids shut. Possibly unexplained failures might be accounted for by the presence of voids due to burned steel which partially welded up by further working after burning so that only an occasional void was left.

Every effort has been made to measure any changes that take place in steel due to heating it to temperatures just below the burning point or within a range of 400 degrees below the burning point. Tensile tests, hardness tests, impact tests, electrical conductivity tests, microscopic examinations, Mc-Quaid-Ehn tests, macroscopic examinations, and fracture examinations have been made in an effort to determine to what extent if

S A.E. Nos.	Composition of Steel % C	% N	% Cr.	Atmosphere	Highest temperature to which steel was heated without burning	Lowest temperature at which steel was found to burn
1025	0.28	0.00	0.00	Excess air turbulent	2545	2560
1025	0.28	0.00	0.00	Excess gas turbulent	2625	2675
1045	0.47	0.00	0.00	Excess air turbulent	2475	2500
1045	0.47	0.00	0.00	Gas	2575	2625
1090	0.93	0.00	0.00	Air	2400	2425
1090	0.93	0.00	0.00	Gas	2400	2425
10120	1.19	0.00	0.00	Gas	2320	2350
2320	0.24	3.48	0.05	Air	2570	2590
2320	0.24	3.48	0.05	Gas	2600	2625
3140	0.43	1.20	0.39	Air	2500	2525
3140	0.43	1.20	0.39	Gas	2570	2590
3250	0.52	2.05	0.83	Air	2500	2530
3250	0.52	2.05	0.83	Gas	2525	2550



A view of a continuous and automatic gas forging furnace in large automobile plant

any so-called overheating or excessive heating affects the properties of the steels studied after they have been normalized or heat-treated by quenching and tempering. As a result of this work the following conclusions seem justified:

1. In the lower-carbon plain-carbon steels no effect whatever from excessive heating could be observed after proper annealing so long as the burning temperature was not exceeded.

2. The tests of the medium-carbon steels showed them to be rather brittle after being heated to 2550° F. and subsequently annealed and heat-treated. It will be observed that this temperature is very close to the temperature of burning for this steel which is slightly above 2575° F. The appearance of the microstructure of these samples would indicate that they are in the first stages of being burned. Although they contained no intercrystalline voids, they did contain non-metallic inclusions in the grain boundaries.

3. In the range of plain-carbon steel of about 0.90 per cent carbon the steels after proper annealing or heat treatment appeared to be unaffected by the excessive heating so long as the steel was not heated above the burning point.

4. The S.A.E. 3145 alloy steel seemed to have an overheating range which extends down to 2475° F. Its burning temperature is slightly above 2570° F. Heating this steel into the range from 2475° F. to 2570° F. and subsequently normalizing or heat-treating it seemed to produce a gradual decrease in ductility with increase in temperature and to change the appearance of the fracture.

These conclusions are presented more concretely in tabular form at the bottom of the page table. This table shows the maximum temperatures to which the steels listed may be heated without danger of overheating or burning. These values will not hold if the furnace atmosphere is an oxidizing turbulent one, and may not hold if the period of heating is over two hours.

In the writer's experience it is possible to heat just below the burning temperature, and by proper forging produce a satisfactory perfectly normal steel. However, if the temperatures given in the above table are not exceeded, one can be sure of obtaining a satisfactory product even if the steel is not forged following the heating. It is, of course, assumed that the steel will be normalized or heat-treated following the high-temperature exposure.

A. E. Pierce To Represent A. G. A. on Joint Committee

COL. A. E. PIERCE, President of the Central Public Service Co., Chicago, Ill., has been appointed by the Executive Board as one of the American Gas Association representatives on the Joint Committee of National Utility Associations.

Type of Steel S.A.E. lbs.	Composition of Steel: % Carbon	% Nickel	% Chromium	% Manganese	Maximum temperature at which steel may be heated if over-heating and burning are to be avoided.
1015	0.17	None	None	0.59	2650°F.
1030	0.30	None	None	0.65	2500
1050	0.52	None	None	0.64	2525
1090	0.88	None	None	0.34	2375
3145	0.44	1.20	0.74	0.64	2450

Heating the World's Largest Market With the Ideal Fuel

By R. C. MEIMA

THE South Water Market, at Chicago, Ill., perhaps the largest and most modern produce market in the world, is heated almost entirely with gas steam radiators. The total annual gas load is estimated at about 45,000,000 cu.ft.

This vast structure is made up of 166 units, each of which supplies its own heat to meet its own requirements. At present there are approximately 1000 gas steam radiators in the market, with something like 95,000 sq.ft. of steam radiation. So well have the gas steam radiators performed their function that as more and more units are brought into use, this type is invariably selected to do the heating. It is noteworthy that, even though the hundreds of tenants of the market provide and pay for heating their own sections, gas and gas steam radiators have taken over the heating of practically the entire market. The Peoples Gas Light & Coke Company sold and installed the radiators.

Mr. Meima is with James B. Clow & Sons, Chicago, Ill.

The old South Water Market, located since pioneer days on the site of what is now Wacker Drive, was one of the most picturesque spots in Chicago. When the Chicago Plan Commission decided to build Wacker Drive, a great concourse connecting the north with the west side, avoiding the Loop district, the South Water Trust was formed, which planned and built the new South Water Market several miles southwest of the crowded downtown district.

The market proper covers three square city blocks, besides the railroad terminal yards which were made a part of it. It is built of concrete and steel in 166 separate sections, each consisting of three stories and basement. Each section is 90 feet long by 20 feet wide with 12 foot ceilings. All walls, floors, and ceilings are of solid poured concrete. The basement is used for reserve storage space. The first floor is the receiving, shipping, and temporary storage room, and is very much exposed to the weather. The second floor front composes the office of the company occupying the individual section, and the rear

The South Water Produce Market in Chicago

A typical office in the South Water Market

is used for storage. The third floor is used for additional storage. Mostly all fresh produce is handled in the South Water Market.

To heat this great structure correctly and economically was a severe test for any heating device or system. The widely differing requirements of each individual tenant precluded the possibility of heating the entire market with a central plant. Heating each individual section with a separate system offered difficulties. The offices on the second floor were separated from the basement by partially open produce rooms, which only needed to be kept above freezing. A central plant in the basement would result in large heat losses in the cold basement and in the exposed risers going through the cold first floor.

The offices on the second floor needed 70° F. temperature throughout the working day, and none at night. Most of the prod-

(Continued on page 771)

Lloyd Logan Is First Doctor of Gas Engineering in United States

Lloyd Logan

LLOYD LOGAN, who is the first person in the United States to receive a doctor's degree in gas engineering, has just been granted this high honor by the Johns Hopkins University. He received his early education in Brockton, Massachusetts. His subsequent education was alternated over several years with work in various technical capacities and included, in addition to numerous extension courses, various periods at the Royal Technical College, Glasgow, Scotland, Massachusetts Institute of Technology, Columbia University, and the Johns Hopkins University.

He was recommended by the Advisory Committee of the School of Engineering of this University on October 4, 1929. His thesis subject was "An Investigation of the Manufacture of Water Gas with Especial Reference to the Decomposition of Steam." His technical experience between 1907 and 1917 included the design of machinery and the layout and construction of industrial, power, and gas plants. During the World War, he served overseas in the Third Canadian Division. He was later engaged in industrial plant development studies.

In 1920 he entered the Koppers Company Laboratories, Mellon Institute, Pittsburgh, and later was in charge of the field experimental division of that organization. With the exception of several months spent in research in physical optics, he was with this concern until January, 1926, when he was appointed research associate in gas engineering at the Johns Hopkins University. During the past nine years he has been engaged in research and engineering relating to gas purification, coke and by-products, catalytic processes, and water gas manufacture.

His publications include papers relating to industrial process control and the manufacture of gas. He holds a number of patents relating to these subjects. He is a member of the American Society of Mechanical Engineers, Society of Chemical Industry, the American Chemical Society, and other societies.

What of Our Future Problems?

By HUGH H. CUTHRELL

These extremely interesting remarks, which all gas men can read to good advantage, were given by Mr. Cuthrell at a recent meeting of the new business department of The Brooklyn Union Gas Co., Brooklyn, N. Y. Mr. Cuthrell is now acting manager of that department.

H. H. Cuthrell

IN looking upon our company as a vast entity created and developed for the purpose of serving a community, it is essential to note that such an organization after all is a part of the public that it serves and that it holds the same ideals of community life that is manifested in the greater public which surrounds it. In this relation it is apparent that we must be in touch with the community life and its trends from day to day. As time goes on, ideals change and trends take new directions. Vast forces operate to cause this, so that it behooves us to be awake and observant of the life and demands with which we are surrounded. There is no great central human intelligence driving the world in any definite direction. The movement of civilized life takes its course as a result of many forces, some of which are far from intentional directive agencies.

Many elements are constantly at work changing conditions and bringing new combinations of forces acting to produce situations that must be met in the proper spirit of progress, which in some instances must hold fast to ideals of an older time instead of drifting about with the shifting currents of life that do not belong to the greater stream of progress. The gas industry was first created to furnish light to the public and if no deeper thought than looking upon gas as a means of producing light had formed in the minds of the personnel of the gas industry, our business would have ceased long ago.

With the many improvements that have come into the processes of gas manufacture during its hundred years of existence, that feature of the gas industry has changed less than the utilization of gas itself. The contrast is startling until one realizes that with all the changes in the gas industry it always consisted of two principal factors. The first is the manufacture of a purified combustible to produce heat, and the second is the sale and supply of this product to the public in the manner that will best harmonize with the trends of heat utilization as they gather force from day to day. Owing to the extensive and intensive scientific development of modern chemistry, we can feel satisfied that the production of gas itself has reached a stage where it is incomparable as a fuel, and we have no reason to hesitate or fear contrast or comparison with any other means of producing heat now known to this day and age.

However, in relation to its sale, supply and utilization, a somewhat different problem stands before us. It is inconceivable that the use of heat as one of the greatest of forces for altering chemical and physical conditions in the materials needed by civilized man will ever grow less. The demand for heat is constantly assuming greater proportions. This is occurring along lines dominated by trends of public demand and scientific development that make it imperative that the gas industry prepare itself to meet new conditions whose existence was not foreseen even a few years ago.

One of these is almost as startling as the changed condition that took the lighting load away from the gas industry some years ago—and that is the shifting of the domestic cooking load in its old time form. Specialization in the production of food has replaced much of the home preparation of meals. While gas is the cooking fuel of half the people of the United States, the amount of gas used for cooking in the average home has been decreasing for some years. Yet the appliances used for cooking are becoming better every day. The situation is somewhat complex since other fac-

tors have developed to make a potential home domestic utilization of gas greater than before. Sanitary refrigeration, house heating, and water heating are looming into outstanding prominence as compensative factors that portend a greater average domestic use of gas than could ever have been expected with the cooking load alone. The cooking load has not been lost to the gas industry, it has simply shifted over to the bakers, delicatessens, restaurants, and general food manufacturers. This, together with industrial uses of gas, presents a prospective field for the sale of gas that is far greater than ever known before.

When these conditions are contrasted with our past experience, it is plain that we must be prepared to meet a situation far more intensive than anything known in our past activities. To occupy the new field we are entering, it is not only necessary to secure more help, but to raise the standard of that we now have. We cannot stand still even though some of us desire to rest upon past performances. The relation we bear to the community as a public service organization forces us to look after public interests along the lines of heat utilization, and we must be in a position to meet these new problems intelligently. These changes will require us from time to time to rearrange the new business department to meet the new customers. This will also demand the services of many more technically trained men than we have ever had before. In fact the new developments that are forcing themselves upon the attention of the public are so mechanical, technical, and scientific that we must be ready at any instant to grapple with problems of a nature that a few years ago were being investigated only in the laboratories of colleges and technical schools. For this reason the personnel of a present-day new business department must include those having engineering qualifications. The development of this department will be along lines that give us facilities to meet the problems brought to our notice by our customers who expect and are entitled to service from us. This organization must have the necessary machinery to plan and develop applications for new and obvious fields where heat produced by our fuel can be utilized.

No matter what facilities are provided, success, however, can only be achieved by the whole-hearted cooperation of every member of the new business department.

Joseph Rooney Is Made Assistant Treasurer of A. G. A.

JOSEPH F. ROONEY, an assistant to Oscar H. Fogg, vice-president of the Consolidated Gas Company of New York, N. Y., has been elected assistant treasurer of the American Gas Association.

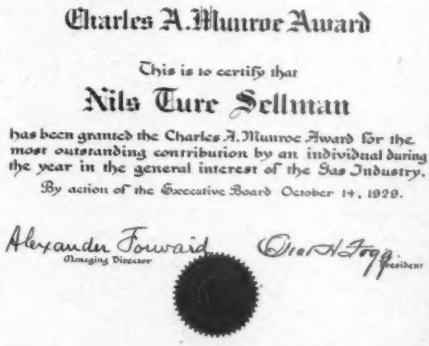
Mr. Rooney succeeds A. C. Ray, of the Electric Bond and Share Co., who has acted in this capacity for two years.

This election was at the November meeting of the Executive Board.

W. H. Barthold Appointed to Finance Committee

W. H. BARTHOLD, of the Consumers Power Co., New York, N. Y., has been elected a member of the Finance Committee of the American Gas Association.

Mr. Barthold takes the place of William J. Welsh, of Staten Island, N. Y., who was elected treasurer of the Association at the recent Atlantic City convention.


American Gas Association

Charles A. Munroe Award

This is to certify that

Nils Ture Sellman

has been granted the Charles A. Munroe Award for the most outstanding contribution by an individual during the year in the general interest of the Gas Industry.

By action of the Executive Board October 14, 1929.

Alexander Forward, Managing Director — Oscar H. Fogg, President

Reproduction of the Charles A. Munroe Award certificate, which was presented to N. T. Sellman, of the Consolidated Gas Co. of New York, at the 1929 A. G. A. convention

A Time- and Labor-Saving Card File System for Gas Meter Records

By JOHN L. CONOVER

The drawer used in this labor-saving card file system for gas meter records. The cards in different positions are shown

J. L. Conover

PRACTICALLY all the revenues of a gas company are based upon the recording of its gas measuring instrument—the gas meter. It is of highest importance that this measuring device be absolutely accurate so that it may be relied upon, both by the customers and by the company, to record correctly the consumption of the company's chief commodity—gas.

Of no less importance is the necessity for maintaining adequate gas meter records, so that the gas company may know at any time how many meters are in service on its lines, how many meters are in stock, how many have been condemned, sold, etc., and the history of each meter since it was purchased, so that the company may have an accurate means of determining that a bill is being rendered for each meter in active service.

If the greatest efficiency is to be obtained, the system of meter records that is used must lend itself to immediate reference so that data concerning any meter, or any group of meters in the same classification, may be obtained readily. The records should be compact so that they may be economically, conveniently, and safely filed, and they should be so designed as to require a minimum of clerical effort in making the necessary entries.

An attempt has been made to meet these requirements in a recent installation at The Public Service Electric and Gas Co., Newark, N. J.

The meter records of this company are centralized at the general office in Newark. Each district office submits a daily report to the central meter record department of all orders that affect the gas meters in its territory. This central department has di-

Mr. Conover is auditor, gas department, The Public Service Electric & Gas Co., Newark, N. J., and chairman of the Accounting Section of the A. G. A.

This illustration shows the meter record filing cabinets

rect supervision over the records of approximately 775,000 gas meters.

A bound ledger system of gas meter records had been used for many years but as the volume of the business grew the necessity for greater clerical efficiency led to the introduction of a card file system. The card system, with its many special features which make it particularly adaptable to meter record requirements, was designed by Henry Muller, traveling auditor of The Public Service Electric and Gas Co.

A meter history card is made up for each gas meter owned by the company and for all subsequent meters that are purchased. Each gas meter is identified by a company number, which is assigned in addition to the manufacturer's number. A separate series of company meter numbers is maintained for each operating division.

The meter record card is four inches by six inches in size. Space is provided in the upper right hand section for recording all information necessary to identify the individual meter and the balance of the card is left for recording the history of the meter since the date of purchase. Only one side of the card is used.

The design of the card embodies three special features. One is a tab in the upper right hand corner, which projects one-quarter of an inch above the card. The company's meter number is stamped on this tab and is readily visible when the cards are filed.

Another feature is that these meter number tabs are provided in different colors. The colors are used to indicate the different sizes of meters.

The third feature is that a series of notches is cut in the bottom of each card. These notches are used, in conjunction with the specially constructed drawers of the filing cabinet, to segregate the meter records by operating districts and by classes, such as meters in active service, meters in stock, condemned meters, etc.

The filing cabinets in which the cards are housed are of all metal construction, built upright, 78 inches high, 31 inches

wide, and 31 inches deep. Each cabinet contains two vertical rows of seven drawers, each drawer with a capacity of 2000 cards, making a total capacity of 28,000 cards per cabinet.

Each vertical row of drawers is suspended from the top of the cabinet by a chain, running over a large ball-bearing wheel. Each row may be moved up or down within the cabinet, the one row counterbalancing the other when loaded with cards.

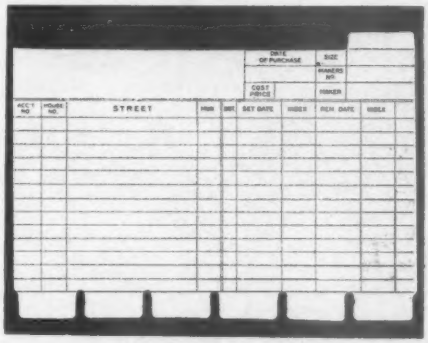
A sliding desk is attached to the front of the cabinet on a shelf which is 36 inches from the floor. Any one of the 14 drawers can be brought to the level of this desk by raising or lowering either row of drawers to the one required.

A cabinet may be operated as a separate unit or a series of cabinets may be arranged in rows, thus permitting a clerk to move quickly from one file to another. The sliding desk can be moved into any required working position at the file.

The interior of each drawer is four inches wider than the meter record cards and is so constructed that the cards may be placed in five different "positions," from left to right, according to meter classification. Small strips of moulding run lengthwise on the inside bottom of each drawer and the notches in the bottom of the cards fit over these "guide bars." This arrangement holds the cards in their proper positions.

All meter record cards are filed according to company meter number, by operating divisions and districts. The use of the notched cards, filed in the specially constructed drawers, permits the segregation of the cards by a pre-arranged classification, at the same time retaining their numerical sequence.

The procedure for entering the meter data on the cards is as follows: The completed meter orders, received from the local offices, are sorted into numerical order by company meter number to the nearest thousand. The orders are then given to a meter record clerk who locates the proper section of the file, as indicated by index tabs on the outside of the drawers, and adjusts the desired drawer to writing positions at the movable desk.



The meter record card, showing notches at the bottom

The position of the cards in the drawer is a guide to the clerk as to the operating district and as to the meter classification. The desired meter record card, as indicated on the meter order, is therefore located very easily.

For posting, the card is removed from the file and the clerk writes the following "set" or "remove" data, account number, meter location, date, and meter index. When entering a "set" meter order, the index is compared with the last "remove" index to insure against any inaccuracies.

When the entry is completed, the card is returned to the file and placed in its proper classification position in the drawer. Assuming that the order is for a set meter, the card is removed from the "stock" position and returned to the "active meters" position under the specified district; or if the order indicates a removed meter, the card is removed from the "active meter" position and returned to the "stock" position, etc.

The compactness of the files and the ready visibility of the meter numbers on the cards permit posting to be done very rapidly, as no time is lost in locating the right cards. Each clerk has the records of 28,000 meters immediately available and by moving just a few feet to another cabinet at the left or right, access to a like number of cards is obtained.

(Continued on page 766)

R. M. Searle Is Found Dead at Rochester, N. Y., Home

R. M. Searle

ROBERT M. SEARLE, President of the Rochester Gas & Electric Corp., Rochester, N. Y., was found dead at his home in Rochester on Nov. 13

Mr. Searle, who rose from office boy under Thomas A. Edison to an outstanding position in public utilities circles, was 60 years old.

Mr. Searle was born in Peekskill, N. Y., on March 3, 1869. Later he went to Philadelphia, where he became a boiler fireman and gas maker for The United Gas Improvement Company. Here he advanced rapidly. Before leaving the Philadelphia concern to become foreman of the Consolidated Gas Company plant in New York City he had had charge of a number of plants as superintendent and engineer.

Later he returned to the U. G. I. as superintendent of various plants, and still later became operating executive of the Westchester Lighting Co. at Mount Vernon.

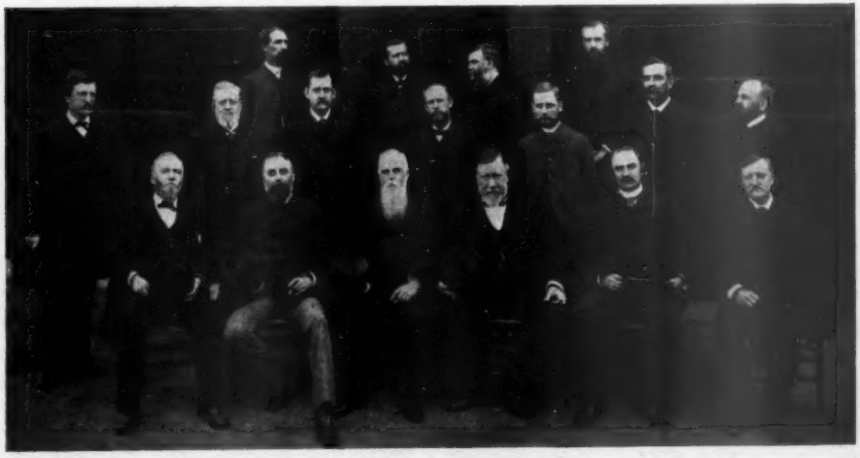
In 1906 Mr. Searle was appointed general manager of the Rochester Railway and Light Company, at that time controlled by the Andrews-Vanderbilt interests. The Rochester Gas and Electric Corporation grew out of that company and Mr. Searle was advanced to the vice-presidency and later to the presidency.

Mr. Searle has remained the unanimous choice as head of the corporation by holding concerns which subsequently have controlled it. He remained president under the Rochester Central Power Corporation, an E. L. Phillips organization, and was retained after the company had been purchased by the Associated Gas and Electric Company.

Mr. Searle has taken a leading part in civic affairs. He was at one time president of the Rochester Chamber of Commerce. In 1922 he became a member of an advisory committee to assist the Public Service Commission in aiding State public utilities to obtain fuel during the coal strike. Later he became Fuel Administrator for the Western District of New York.

Robert M. Searle was known as a strenuous worker and an inventor and engineer of exceptional quality.

He was president and director, at his death, of the Rochester Gas and Electric Corporation, the Mount Morris Illuminating Company, the Mount Morris Water Power Company, the Geneseo Gas Light Company, the Caneadea Power Corporation, the Hilton Electric Light, Power and Heat Company, and the Cooper Electric Corporation, and was a director of the Security Trust Company of Rochester.



This picture of the Society of Gas Lighting, taken in Jersey City, N. J., May 21, 1885, has recently come into the possession of the American Gas Association. Those in the picture are: Top row, left to right—A. B. Slater, Alex. Strecher, Wm. Mooney, Chas. Nettleton; second row, left to right—D. D. Flemming, Samuel Stiness, A. M. Smith, C. H. Coggeshall, C. J. R. Humphreys; Wm. Stedman, Chas. Lamson; bottom row, left to right—F. C. Sherman, F. S. Benson, J. H. Armington, J. R. Thomas, Eugene Vanderpool, Wm. Coombe

Investment Bankers Report on Gas Industry

AT the eighteenth annual convention of the Investment Bankers Association of America, held at Quebec, October 12 to 18, the Committee on Public Service Securities presented a comprehensive report that touched the high points of the year's utility developments.

The committee's comments on the gas industry are quoted here:

Manufactured gas is essentially an urban business. Originally chiefly used as an illuminant, it has given over that field to electricity, and is now supplying the heat demands of a steadily-growing business. It is an indispensable agency of modern civilization, both in the home and in industry. In the past few years, gas has been applied to house heating with marked success, and this business is likely to have a very large expansion. The household appliances and industrial devices to increase its use are constantly enlarging sales. Gas service is one of the oldest of the utility services, and it has found a way to adjust itself both to competition and to the changing character of demands. The proportions of the manufactured gas business in this country are indicated by the following aggregate figures: The revenue from gas sales amounted to $518,000,000 in 1928, an increase of 3.5 per cent over 1927. The gross corporate income was almost three times interest and amortization charges, leaving a balance for 1928 available for dividends and surplus of over $14,000,000, an increase of 17.6 per cent over 1927. Fixed capital as reported totals over $2,500,000,000; capital stock $1,077,000,000; and long-term debt just under $1,000,000,000.

With this growth, have come marked improvements in the methods of production, and the tendency is now in the direction of large, advantageously-located by-product plants, in which the distillation of coal is carried to the last refinement, with gas as one of the by-products. Whereas gas was originally distributed under a low holder-pressure, modern practice is more and more using comparatively high-pressure transmission lines and of increasing length, delivering at convenient points to the low-pressure systems of direct service. Thus, formerly isolated services are being coupled with a single large, highly-efficient and well-located producing plant serving the whole, the local plants being shut down, dismantled or held as standbys. This evolution of the business is highly important, giving to it the opportunity to improve its load factors and to adjust its investment to the service rendered not theretofore possible.

But in parts of the country natural gas has been opened up in such quantities, so easily can it be transmitted long distances, and so exceptional are many of its qualities that many artificial gas companies have been forced to adopt its use, and others will have to. This forces on such companies not only a decrease in both gross and net earnings but also a period of several years, according to circumstances, for recovery. Cost per thousand cubic feet to the customer is often substantially reduced. The higher thermal value of natural gas (approximately double that of manufactured) cuts the demand nearly in half, and on top of that operating costs are likely to go up, initially at any rate, because the dry natural gas increases main leakage in systems adjusted to moist manufactured gas. On domestic business alone, recovery even in growing communities might be expected to take several years, though in practice the very marked availability of natural gas for house heating especially in the cooler climates, and for industrial uses may often so increase sales that the transition period may be much shortened. Western New York and Pennsylvania, Ohio, West Virginia, and northern Kentucky are covered with natural gas lines, so also are Texas, Oklahoma, northern Louisiana, and eastern Kansas. From the Amarillo fields in the Texas Panhandle, Denver and Kansas City are already served, 375 and 450 miles distant respectively; New Orleans has just been connected with the Monroe fields of northern Louisiana, 250 miles; Memphis also, 200 miles; St. Louis is being connected, 425 miles; and Atlanta, Georgia, also, 450 miles. It is also planned to connect Chicago with the Amarillo fields, some 900 miles distant. If the West Virginia fields are sufficiently productive, some of our seaboard cities may have their natural gas. That this gas supply is abundant for years to come there can be no doubt.

Russian Visitor Stops at A. G. A. Headquarters

AN interesting visitor at A. G. A. headquarters recently was M. Shahnazarov, mechanical engineer, and manager of production and utilization of natural gas, Government Oil Trust "Azneft," Bakou, on the Caspian Sea, in the Union of Socialist Soviet Republics.

Mr. Shahnazarov made a thorough tour of the natural gas and oil sections of the United States, and visited Texas, Oklahoma, Pennsylvania, California and Louisiana.

Newspaper Comment on Smoke

TWO interesting editorials on the smoke nuisance recently appeared in two New England newspapers, as follows:

Whose Is The Smoke?

(From the Springfield Union)

"Fuel experts now in conference in Philadelphia seem to be agreed on the proposition that the chief responsibility for the smoke nuisance in large cities rests upon the household consumers of coal. In support of this contention they point out that the home chimneys greatly exceed the factory and railroad smokestacks, both in number and in wide distribution, and they assert that far less coal is used for industrial than for household purposes and that very little of the coal used by railroads is consumed within city limits.

"As to home chimneys exceeding all others in number and in wide distribution, there is no room for dispute. It would have to be so, unless urban populations were herded in great barracks, each with a single smokestack. Fortunately we have not come to that, nor are we likely to, unless during some period of wholesale aberration we should embrace Bolshevic theories and practises. The multiplicity of home chimneys in American cities and towns is a happy index of the superior living conditions under our despised capitalistic system.

"However, it does not necessarily follow that because the home chimneys outnumber the industrial chimneys the household consumption of coal exceeds the industrial consumption. In fact, the relation of the one to the other must vary markedly in different cities, according to the size of the population, the number of homes using oil, gas or electricity for heating and cooking, and the number and character of the industrial plants. The impossibility of arriving at a standard of comparison that would apply to cities in general is self-evident.

"As for the house chimneys creating more of a smoke nuisance than the factory smokestacks, that, too, is decidedly open to question. If it were a fact, it would seem that the residential sections of a city would be the scene of a constant smoke nuisance. As a matter of fact, in cities of Springfield's type, at least, wherever and whenever a smoke nuisance has been observed or complained of in a residential section the cause of the nuisance has been traced to some nearby railroad or factory or group of factories.

"The fact that in Springfield and other New England cities there is very little use of soft coal for household fuel may make considerable difference. In other sections of the country there is more use of the smokier soft coal for domestic purposes. Here as elsewhere, however, bituminous coal is the grade commonly used for industrial purposes and by the railroads, and factory chimneys and locomotive smokestacks, when they do emit smoke, emit it in huge volumes which are not quickly absorbed and dissipated in the atmosphere, as is the smoke from a house chimney.

"All in all, we are inclined to think that the findings which the fuel experts have arrived at in their Philadelphia conference are a bit far-fetched, at least so far as New England is concerned, and possibly also in regard to many cities in other sections. In Springfield we know that the official smoke inspector is chiefly occupied with making the factory and railroad smokestacks behave, and we do not recall a single instance in which he has ever been called upon to direct his activities against the home chimneys."

The Smoke Evil

(From the Burlington Free Press)

"Burlington began a crusade against soft coal smoke some time ago but, judging from the clouds of black soot belching from various chimneys in our city, it has not resulted in the elimination or abating of this nuisance. White painted buildings must be constantly renewed, and housewives complain bitterly in many instances of the blackening of white washings hung out to dry.

"Nor is Burlington alone among American cities in suffering from the smoke nuisance. Indeed, some of the leading cities have had fine building exteriors practically ruined by this evil. Burlington has not suffered to that extent, but that is no reason why we should continue supine.

"The Canadian metropolis is one of the big cities that have been fighting the smoke evil. Under the heading 'The Smoke Nuisance' the **Montreal Star** says:

" 'For more than a quarter of a century the City Council has been discussing the question of smoke abatement in the city but no definite solution of the problem has been arrived at. A special civic committee is now investigating the matter once more. Today smoking chimneys are seen in the industrial sections, despite all protests. That the smoke evil is responsible for more than mere annoyance is proven by the findings of a United States Smoke Commission.

" 'In its report the Commission declares that smoke in addition to being a nuisance is dangerous to health, and that smoke destroyed tremendous amounts of property every year. It was further held that not only are dry goods injured by smoke, but that public buildings, metals, and many other things are defaced by it—the sulphur in the smoke being the principal cause of the loss. In regard to the effect of smoke on the human body, the Commission asserted that medical practitioners declared that the lungs

(Continued on page 782)

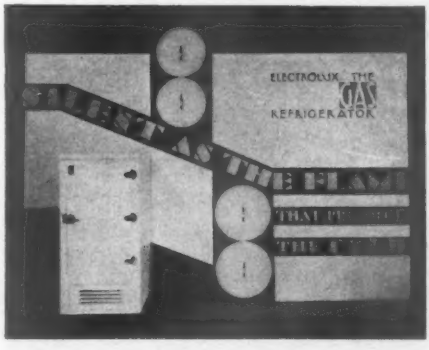
Kings County Wins Refrigeration Contest

From left to right: Guy Philp, display manager; H. P. McDonald, advertising manager; P. J. Griffen, Servel Corporation

From left to right: J. L. Sullivan, J. J. Gordon, R. Laux, J. R. Himstedt, S. H. Lind, supervisor of refrigerator sales.

PARKED in the most prominent window of the Kings County Lighting Company building in Brooklyn, N. Y., is a beautiful, new, shiny Chrysler "77" sedan. This unusual display creates much admiration and some amazement in the minds of the passers-by until a reading of the congratulatory telegram reveals that the car was won by the sales force of the Kings Appliance Corporation in the recent sales contest sponsored by the Electrolux Servel Corporation. The winning of this prize was the culmination of many months of missionary work and educational advertising. However, the pride in their splendid success is the reward of their efforts.

When the contest was first announced, there was a feeling of confidence in Brooklyn. A firm foundation of sales procedure had been laid, a demand for gas refrigeration created, and the salesmen, sure of themselves, their product, and their organization, entered the three months' competitive period with the additional enthusiasm always brought out by such a contest.



A typical window display

The education of the public in the district covered by the Kings County Lighting Company has been very thorough. Not for one moment have its customers been permitted to forget "gas refrigeration." The local newspapers carry well-designed and attractive advertisements that demand instant attention and constantly hammer home the many advantages of the gas refrigerator. Window displays are so compelling and so beautifully worked up that people walk out of their way to see what new ideas Guy Philp, the display manager, has to offer. Carefully prepared inserts, sent out each month with the gas bills, are not only read and digested but many actual sales can be traced to this medium of advertising. Even the gas bill itself carries on the reverse side a friendly "ad." Incidentally the gas bill advertisement, though inexpensive, is enormously effective when interestingly done.

W. A. Morris, sales manager of the Kings Appliance Corporation, is a firm believer in house to house canvasses. They are carried on periodically by each salesman in the exclusive territory allotted to him. Missionary work of this kind has sold many refrigerators and without question has paved the way for many other installations.

The record of S. H. Lind, the supervisor of refrigerator sales, and his crew of alert salesmen has been an exceptional one. The winning of this contest, by more than doubling their assigned quotas, has only been a part of their splendid sales performance. Taking adavntage of every opportunity they have increased their sales from month to month and the Kings Appliance Corporation now stands first in the sale of refrigerators on a meter basis.

If this contest has done no other thing than demonstrate what one small sales force, well trained, well prepared, and well organized, can do and is doing in a limited territory, that alone compensates for the time, expense, and effort in promoting it.

A. B. Tunis Succeeds H. F. Weeks As Staff Member of A. G. A.

A. B. Tunis

HOWARD F. WEEKS, for the past four years editor of the A. G A. MONTHLY, and for several months secretary of the Publicity and Advertising Section, resigned December 1 to join the Consolidated Gas Company of New York. He will be succeeded by A. B. Tunis, secretary of the Virginia Public Utilities Association, Richmond, Va., and director of the Virginia Committee on Utility Information.

Mr. Weeks joined the A. G. A. staff in January, 1926, as editor of the MONTHLY and assistant secretary of the Publicity and Advertising Section. In August, 1929, he was made secretary of the publicity section. Mr. Weeks is also treasurer of the Public Utilities Advertising Association. Previous to joining the A. G. A. staff he was news editor of *Gas Age-Record*. He attended Brown University, Providence, R. I.

Mr. Tunis has had varied experience in editorial and publicity work. A native of Maryland, he was educated at the Norfolk, Va., Academy, and his first work was as a reporter on the *Ledger-Dispatch* at Norfolk. Later he became city editor of the *Times-Dispatch*, at Richmond; for two years was on the copy-writing staff of an advertising agency, and for five years was agent of the public relations department of the Chesapeake and Ohio railway, editing its employee magazine. Mr. Tunis has been connected with the Virginia Utilities Association since January, 1928.

In commenting on this change in the personnel of the American Gas Association, Managing Director Alexander Forward said:

"The Association loses with deep regret the services of Mr. Weeks whose faithful, painstaking and efficient work has added so greatly to the value of the A. G. A. MONTHLY to our members and to the activities of the Publicity and Advertising Section and who has won the affection and regard of headquarters staff and of the industry.

"Mr. Tunis' qualifications with a public utility association, as a magazine editor, as advertising copy writer, and a newspaper man of well-rounded experiences admirably fit him for his new work with the Association."

Merchandise Accounting—Its Importance

By H. C. DAVIDSON

H. C. Davidson

THE Joint Committee has expended much thought during the past year in the effort to make a practical and constructive contribution upon the subject of merchandise accounting. Its report has been printed and is available for distribution.

The Committee membership includes representatives of outstanding ability both from the Commercial and Accounting Sections. They understand clearly, I believe, the subject under review. But neither group represents the source of this problem. It is the executive I am after today. For the successful accomplishment of the task in hand depends at present rather more upon the executive, I believe, than upon the sales department or the accountant. Underlying the mechanics of a system of accounts to record adequately the results of merchandise sales is the necessity of determining fundamental principles of policy as to the relationship of this activity to the gas business.

It is upon that question that we need the consideration of the executives of the industry.

In the first place, gas companies, as I understand their appliance sales, are not merchandisers of appliances, domestic or industrial. They are engaged in the never-ending task of merchandising one product—gas service—and every so-called merchandising activity is in reality merely a part of the promotional program for the extension of that service. So, I approach a discussion of this subject from the viewpoint that it is really one of promotion, and that the accounting problem involved is one of recording adequately the results of promotional efforts, which may or may not be self-sustaining, and may be carried on by the company itself or through outside agencies.

One of the difficulties with this question seems to be that in many companies the sales departments are apparently required to do a promotional job, which is being judged on a merchandising basis.

I have talked with the sales managers of many companies, and find a general feeling of accountability on their part to their respective executives to produce a net profit from the merchandising business. That is all fine and proper. But, those very departments are generally undertaking a great deal more than merchandising. Furthermore, they are usually required to accept existing facilities as to display space, advertising, and other costs, which may be quite out of proportion to the volume of sales. The conditions do not seem to be entirely fair to the sales managers.

If they were given opportunity to develop in their own way a profitable gas appliance business, independently of the gas business, and unhampered by any considerations of load building, I am sure they would do a creditable and successful job. But, as I view their work, they are expected not only to do that, but also to give equal consideration to the promotion value of the material they are selling; and on top of that, the results of their operations are often loaded down with "scientific" apportionments of indirect expenses from the fertile minds of the accountants. To me it is no wonder that the final figures often indicate unfavorable results.

No matter how good a job the sales manager may be doing, and no matter how well the accounting records may show the financial results attained, we cannot make real progress upon this question if the executive passes upon the results, thinking in terms of "merchandising in the red." In fact, there is no more reason to refer to the cost of this activity as "merchandising in the red," than

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Mr. Davidson is secretary of the Consolidated Gas Co. of New York, N. Y.

Presented at Commercial Section meeting, A. G. A. convention, Atlantic City, N. J., Oct. 14-18.

to describe your production costs as "manufacturing in the red." The term "merchandising in the red" is of itself evidence of confusion between merchandising and promotion. No company is "merchandising in the red." If its results are in the red, it is not merchandising. The promotional elements of cost are the causes of the red figures, and logically and rightfully so.

The point I wish to make is that the relationship of merchandising to the gas business is an element of operating expenses and not as an independent source of revenue. It is only when the whole program of merchandising effort is combined with the additional quantity of gas sold as a result that we can rightfully think of the subject in terms of revenue.

If you do not subscribe to that conclusion (and it is apparent that some companies do not) answer this question. Why are the gas companies engaged in selling appliances? Surely it is not because that field offers such unusual opportunities for profit as a sideline. If that were the case, why bother with the gas business at all?

Did you ever ask a successful storekeeper how he came to stock this or that item of merchandise, and have him answer that he did not understand why the people wanted it, but that they did, so he carried it? That is meeting a *merchandising* demand.

What the gas companies are called upon to meet is a *service* demand. They are selling gas appliances primarily as a part of their promotional program for the extension of that service. They cannot rest content with offering for sale only those appliances which can be sold profitably as merchandise. They must stimulate public demand for every type of appliance within the economic field of gas as a fuel, and there is no inherent difference in the promotional principles involved in the marketing of one type of appliance from another.

The facts, as I see them, are that the utilities are striving for a lot of things in their merchandise sales, some of which may come within a strict interpretation of merchandising, as the term is used commercially, but more are in reality of a promotional nature. The two are so interwoven that it is not possible to draw a clear line between them. In every transaction the promotional element is present and consciously or unconsciously influences the merchandising policies.

Most companies are retailing successfully appliances for which there is an established demand. But that is only the "cream" in the broad program of new business development. Because our "best seller," the domestic range, can be sold profitably at retail does not establish it in a different category from other appliances not so favored. In fact, I doubt if the wholesaling of the same appliances can ordinarily be conducted successfully as a merchandising venture although it may prove highly profitable as a new business activity.

As is pointed out in the report, I believe that the sale of appliances—including those which can pay their own way and those that cannot—is more essential to the success of the *gas* business than to the success of the *merchandising* operations, and that the true measure of the success of merchandise sales is in terms of net cost and net return to the gas business.

The most vital need in respect of the sale of appliances by the gas industry today, in my judgment, is that the companies reach some unanimity of opinion as to the real objectives of appliance sales. The main question before this committee is not one of accounting, but one of policy for the executives to settle. As long as there is a Babel of opinions as to the policy, neither the accountant nor the new business manager will be able to accomplish any industry-wide results. To me there is the same need to reach a common ground as to policy on this subject as there is upon such problems as rate structure, public relations, and the engineering and commercial practices of the industry.

Let us consider some of the underlying causes of this apparent confusion or difference of opinion in the relationship of merchandising to promotion which seems to exist within the industry.

One company avows, say, that it is not

engaged in the merchandising business as such for profit, and that its merchandising policies are shaped as a part of its promotional program. If it happens to be located in a community already developed, in which the normal increase in annual volume is small, it naturally concentrates its attention upon promotion and co-ordinates all its sales efforts with that objective. It may even be compelled to apply intensive efforts toward retaining present business in the face of competition or other economic causes endangering its continuance. In short, we may have a condition where the promotional exigencies are so obvious that they inevitably dominate company policy.

In contrast, consider the position of a company in a fast growing community, enjoying steadily increasing sales at a gratifying rate without artificial stimulation. It is probably not concerned seriously with intensive promotional effort and looks upon its appliance sales as a matter of merchandising.

Thus we may have two companies actually doing exactly the same thing, but apparently following radically different policies.

In order that you may realize that the differences in company policy to which I have referred are very real and strike to the very root of the question of merchandising by the utilities, I will quote from a letter of one of the members of the committee commenting on the 1929 report:

"The main difference and most objectionable part of this report to us is the matter of subsidizing the merchandising department. In our properties we endeavor to have this department stand on its own feet and pay its own way. So far we have not been entirely successful in all properties, but there has been a marked tendency to improve this condition in all our properties and this is being done without any allocation of merchandising expenses to the new business or any other department."

It is apparent that the companies in question look upon their merchandising activities as something apart from and unrelated to their utility operations. It is hard to conceive of a display room for gas appliances, however, which is not the source of at least a portion of the industrial or wholesale sales of a purely promotional character.

Essentially the problem calls for close cooperation between the executives and departments involved

It is not my intention to argue the merits of that policy here. I merely call attention to it, in contrast to the view held by other companies, that the sale of appliances cannot be divorced from the gas operations and represents the only means of extending gas service.

You can readily appreciate the difficulties of the committee in reaching any finality on this question under present circumstances, and can realize its problem in attempting the task of submitting a system of accounts which will be suitable alike, on the one hand, for a separate commercial merchandising enterprise, and, on the other, for a subdivision of operating expenses of the gas business.

And now may I refer briefly to the 1929 report of the committee and its relation to these questions of policy regarding merchandise sales. The system of accounts recommended for merchandising operations is conventional in form and follows closely the present practices of many companies. It does not by any means represent the unanimous views of the committee, however. The committee was not unanimous either as to the elements of cost to be included or as to the grouping of the accounts involved. Many sharp differences of opinion developed as to the accounting details, and there were nearly as many viewpoints expressed as to the proper accounting procedure for some items as there were companies represented.

(Continued on page 775)

Shown here are the employees of The Brooklyn Union Gas Co., Brooklyn, N. Y., who were presented with McCarter Medals for Life-saving recently. Charles Hosking, picture 14, was presented with the McCarter Bar, having already won the Medal. The pictures are as follows: 1, John Duffy; 2, Daniel McDonald; 3, C. N. Bopp; 4, Edward Hurley; 5, James Conner; 6, John Stenger; 7, Antonio DiNalli; 8, L. L. Ege; 9, F. W. Knapne; 10, E. F. Porter, Sr.; 11, John Keenan; 12, James Smith; 13, E. J. Cantwell; 14, Charles Hosking; 15, E. A. Murphy; 16, Geo. Moseman; 17, J. V. Duspiva; 18, J. J. Mathews; 19, Wm. Smith; 20, J. H. Brideson

Economic Aspect of Natural Gas Projects

By THOS. R. WEYMOUTH

T. R. Weymouth

FOR the purpose of study, either from the standpoint of engineering and design, or from that of economics, every natural gas project may be subdivided into its three principal elements, production, transmission, and distribution. The production division comprises the gas leaseholds and gas wells; the transmission system includes the gathering, field, and main lines to the city borders, and the compressing stations, and the distribution system comprises everything from the city borders to the point where gas is delivered to the customer.

Production System

Most of the large gas fields in the United States have been discovered in a search for oil. In fact, in the early days the gas was considered to be an obstacle in the oil operations and worth little or nothing. No market had been developed for it and the knowledge of its use was extremely limited. Consequently, vast quantities were permitted to blow to waste into the air and permanently lost. When finally markets began to appear, the gas itself was not placed on a value basis comparable with other fuels, but was regarded as a by-product for which any price in the neighborhood of zero was deemed to be sufficient. This led to the establishment of rates as ridiculous in form as they were in magnitude. In many instances the customer was charged a flat sum per year for all the gas he might wish to use, while in other cases the rates were a small sum per month per appliance.

These practices eventually succeeded in dissipating the surplus gas supplies, and in order to meet the demands of consumers who had become accustomed to the use of gas it became necessary to seek additional fields, and this gave rise to the search and drilling for gas itself, as it was found that the gas produced as an incident to oil production was not in sufficient volume to be depended upon. And so today in order to meet the constantly increasing demand of customers, the natural gas utility must be ever extending into new fields and drilling up the fields it is already operating. The steady withdrawal of gas from the fields causes a gradual decline in the productive capacity of existing wells and a reduction of the rock pressure in the sand, which in turn produces a corresponding diminution in the productive capacity of the new wells drilled, with the result that the cost per MCF to produce the gas mounts ever higher and higher.

This feature of the natural gas industry is to be contrasted with the manufacturing process in the manufactured gas industry or the generating plant of the electric industry wherein the cost of the commodity distributed remains fairly constant or even is susceptible of reduction by virtue of improvements in the process of manufacture or decline in the price of coal or oil.

In this respect the natural gas industry is unique and different from any of the other utilities due to its dependence upon a basic material, the supply of which is restricted to comparatively narrow limits and which can never be replaced, while the others depend upon a supply of raw materials and fuel so vast as to be regarded as practically inexhaustible. For this reason the natural gas industry as such is one of definitely limited life and, at least as far as the production system is concerned, it is necessary to attempt to predict its life expectancy and amortize its cost within that period. There have been several instances where natural gas service has been abandoned because of exhaustion of supply. Consequently, most large natural gas systems seek to expand

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Presented at Technical Section meeting, A. G. A. convention, Atlantic City, N. J., Oct. 14-18.

and diversify their sources of supply so as to depend not on one or two fields only but on many, as in the case of the company with which the writer is associated, in which there are more than 30 separate and distinct fields from which it draws its supply. Not only does this extend the life of the system, but it also gives assurance of a stable and dependable service.

The economic value of a gas field is not necessarily entirely destroyed when the supply of gas has been withdrawn from it. There are several cases now on record and possibly many more opportunities available where abandoned fields have been and may be used for the storage of gas, thus furnishing an opportunity for leveling the operating load curve, not only for the day but also for a whole season. To be sure, this does not help the revenue curve to a marked degree, but it does greatly benefit the operations with a corresponding reduction in operating expenses per unit of product. It also permits supplying a greater peak load without additional capital investment in production system and therefore has a very large value to the utility. As an illustration of this value, there is one field of this character which has for several years been used for seasonal storage of natural gas which is capable of superimposing upon the total field delivery capacity of the system an additional supply at the rate of ten millions of cubic feet per day for peak demands, thus making it unnecessary for the company to provide additional reserves of new gas to that extent.

In order to make use of old gas fields in this fashion it is necessary that the company control the entire acreage in order that no one could drain off the gas stored, and the reservoir must be known to be gas tight.

Transmission System

With the exception of natural gas pipe lines designed to supply a definite market with a more or less definite supply of gas, most transmission systems have been the result of gradual growth with the development of the business. Viewed from an operating standpoint, as well as from that of greatest security of service, a system of multiple or looped lines is the most desirable, inasmuch as it is possible to operate at different pressure ranges in the separate lines of such a system to suit the requirements of differing field conditions in the several sources of supply, and if a break should occur in one of the lines, the service would not necessarily be seriously interfered with.

From an economic standpoint, however, a single line of proper size to meet the peak requirements is the most desirable. The carrying capacity of a pipe line with given pressure limits is proportional to the eight-third (8/3rd) power of the diameter, whereas the cost is proportional roughly to the first power. On this basis the cost of a single line is only about 65 per cent of that of two lines having the same capacity. Furthermore, the security of service with a line which is properly built is ample as is proved by many instances where large and important cities have depended on a single line for their service for 40 years or more and have never suffered a single shut-down.

With the above facts in mind there is ample justification for the many single pipe lines of great length which have been built within the last few years and the cities depending upon them can feel reasonably assured that they will receive satisfactory and continuous service as long as the supply of natural gas is available.

Recently there has been considerable discussion as to the feasibility and economy of operating pipe lines at higher pressures than have been used heretofore. It is proposed to increase the pressure limits from the present figure of about 400 lbs. per sq.in. to an upper limit of about 2000 lbs. The quantity of gas that will flow through a pipe line is very nearly proportional to the absolute pressure at the intake and when the outlet pressure is less than half of that at the intake. Thus for all practical purposes if the intake pressure limit is increased from 400 lbs. to 2000 lbs. with a city gate pressure of 100 lbs. or less, the capacity of the line would be multiplied about five times, or conversely, for the same service, a line of

(Continued on page 762)

The Key to Coal's Treasure Chest

By C. J. RAMSBURG

This address was broadcast recently over Station WCAE, Pittsburgh, Pa. Dr. F. W. Sperr, Jr., followed Mr. Ramsburg with an address on a related topic. We are pleased to present these talks in the MONTHLY, since they are the first, it is believed, ever to be broadcast on this subject. Dr. Sperr's talk will appear in the January MONTHLY. As every one knows, Mr. Ramsburg is vice-president of The Koppers Company, Pittsburgh, Pa., and is a member of the Executive Board of the American Gas Association

THE Chinese have a saying that a picture can tell a story more clearly than can be told with a thousand words. With this in mind, let me describe an event which took place in London 117 years ago which had a marked effect on our civilization.

Three men are standing around a table in a lodging house. One of them is Albert Winsor, the promoter and later to be the builder of the world's first gas plant. On the table is an apparatus which Winsor has told the other two men will produce from coal, a gas which can be used to give light and replace the smoky torches which were then in common use employing whale oil. He arranges a part of the apparatus which looks like a teakettle. He opens the top and shows them that it is filled with coal. Under the kettle burn several large wicks. Soon a light brown vapor issues from the mouth of the kettle. Winsor lights a fagot and touches the light to the issuing vapor. It catches fire and burns, giving a light which to them seems miraculously bright. This is the first authentic promotion of gas lighting.

Winsor is a promoter. The other two men are bankers. They appear indifferent. Finally Winsor turns from his apparatus and goes to the window. Raising one arm in the direction of the great city enveloped in smoke, Winsor exclaims: "There lies London groping in smoke and fog." Then, pointing to his crude apparatus on the table, he says, "And here, gentlemen, is the remedy. Gas for lighting and coke for fuel."

Thus was born the world's first company to make illuminating gas and coke from coal. Years before Winsor's time, John Baptist van Helmont, of Brussels, discovered that coal, when heated in a closed vessel, yielded up what he called a "wild spirit." Others made the same discovery, but they failed to put this "wild spirit," which was illuminating gas, to practical use. The man who finally did this was William Murdock,

Frederick Albert Winsor

An engraving recently added to the American Gas Association collection

father of the gas industry, whose experiments with gas made it possible for Winsor to interest capital and establish the first gas company. Winsor and Murdock were arch haters of smoke and soot. They understood coal for what coal is—not a fuel, not something to be burned, but a raw material from which a marvellous illuminant and hard smokeless fuel could be made. To them, coal was stored-up sunshine, ready to be released in the form of gas light to brighten up dull and drab living conditions.

Winsor had demonstrated to his bankers that when coal is heated out of contact with the air, illuminating gas and coke result. "What other marvels does coal contain?" the world of science inquired. Thereafter, coal went into the laboratory, the test tube, and the experimental furnace. Finally, the chemist entered the picture and developments came fast.

While today gas for illuminating purposes has been largely superseded by the more adaptable electric light, for 100 years il-

luminating gas faithfully served the world. Today it has entered into a new and greater field, that of furnishing fuel for home and industry.

Today we know that the burning of raw coal is an economic crime, not only on account of the loss of valuable by-products, but because of the resulting smoke nuisance, injurious to health, destructive to property, and costing this nation at least $600,000,000 a year. "Out of a lump of coal," says the world of science, "we can effect a veritable resurrection. From this lump we can create colors more beautiful than those in the rainbow. Indeed, we can create dye colors such as mankind has never seen before. We can make medicines which surpass the healing art of the old remedies of nature—drugs, disinfectants, insecticides, explosives, motor fuels, fertilizers, and hundreds of other products and articles essential to our advancing civilization."

How is this done? How can science, from lumps of coal, create such marvellous products? The opening key is the by-product coke oven. The starting point is the manufacture of coke, tar, benzols, ammonia, and fuel gas from bituminous coal.

The modern by-product coke plant is a very impressive affair. Only the barest outline of a description can be given here, however.

Built of silica brick, the coking chamber of a modern coke oven is 40 feet long, 14 feet high, but quite narrow—only 16 inches wide. Each wall of this oven is heated by burning gas in a system of internal vertical flues so that the wall is uniformly of a bright red heat without any dark spots anywhere from end to end to top to bottom. There may be 30 or as many as 80 such ovens in a single battery. Such an oven holds 16 tons of finely pulverized coal. The coal is charged into the top of the hot oven through charging holes from an electrically operated car, and is carefully levelled, leaving a space at the top for the escaping gaseous products. The charging openings in the top of the oven are then sealed, the gas off-takes opened, and the mass of coal is heated for about 15 hours. The doors at each end of the oven are then taken off and an electrically-operated ram is pushed through the oven, discharging the red-hot coke into a steel car. This car is hauled to a quenching station, where the hot coke is showered for a few seconds with water. The car then travels to a wharf, where the coke is discharged to be afterwards screened into the different commercial sizes.

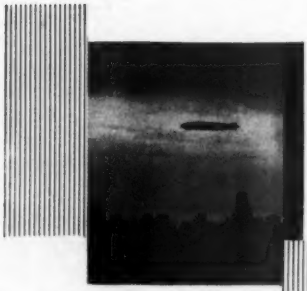
The coking process is very interesting. One would think that when you charge coal between red hot walls only 16 inches apart that the entire mass of coal would be quickly heated through. This is not true. Both coal and coke are poor conductors of heat. That coal immediately in contact with the hot walls fuses first, and this melted zone moves toward the center at the rate of about ½ inch per hour from each wall as the gaseous products are boiled away and pass out of the oven. The two melted zones meet in the center of the oven at the end of the tenth hour and a distinct parting is formed which results in the coke pieces being only one-half the width of the oven—eight inches long.

The by-product coke plant usually makes coke, gas, tar, ammonia, and the benzols. Each oven is connected with a system of gas mains. The hot gases from the oven contain all but the coke. These gases are first cooled and the tar is separated out. The gases next go through a bath of sulphuric acid which combines with the ammonia, forming ammonium sulphate. This material comes out in the form of fine white crystals and is one of our most important fertilizers.

In the removal of ammonia, the gases are reheated somewhat. They must next be cooled and then passed through benzol scrubbers, where the benzols are removed by means of absorbent oil. The gas leaving the benzol scrubber is now ready for distribution. About 37 per cent of it is used for heating the ovens. The absorbent oil containing the benzols is distilled and the product is afterward purified and redistilled, separating into benzol, toluol, and solvent naphtha.

(Continued on page 770)

Advertising in the Modern Manner



THE globe circumnavigated via Zeppelin in twenty-one days! These be speedy times, my masters! And the industries that use gas heat find it quite in step with modern speed and modern methods. A good slogan, that, and true . . . if it's done with heat, you can do it better with gas.

THE PEOPLES GAS LIGHT AND COKE COMPANY - - CHICAGO

GAS HEAT

Of the trends and changes in Industry, the most striking is the present one toward the wider use of Gas. The economic possibilities of Gas Heat are of major importance to every man at the head of every manufacturing business.

THE PEOPLES GAS LIGHT AND COKE COMPANY CHICAGO

OUT of the maze of perplexities that confront manufacturers, one fact emerges clearly: gas is the most economical heat available to industry.

There is no investment in stored fuel nor in storage equipment, no expense entailing for fuel time on non-delivery of fuel, no fuel purchasing overhead.

THESE and many other basic features of gas are possible because of the gas company's facilities in storing gas in large quantities. Let the gas company's holder store your fuel.

THE PEOPLES GAS LIGHT AND COKE COMPANY - CHICAGO

GAS HEAT

THE use of gas for the melting of metal or the processing of any industrial product removes from executive shoulders all of the responsibilities inseparable from crude fuels; thus gaining ample time for the solution of the many problems this modern age presents.

Those who win in business are those who have sufficient time to find ways and means of meeting the public fancy . . and are thus able to keep two steps ahead of its latest whim.

THE PEOPLES GAS LIGHT AND COKE COMPANY CHICAGO

INDUSTRY has looked upon Gas and found it good. Wherever the wheels of Industry turn, there Gas serves, unremittingly and whole-heartedly. The tasks of every branch of Industry have been immeasurably lightened by the application of Gas Heat. Down the alphabet of heat applications, from annealing through glass-blowing and bolt-shrinking to zinc refining, you will find you can do it better with Gas every time.

THE PEOPLES GAS LIGHT AND COKE COMPANY
CHICAGO, ILLINOIS

THE PEOPLES GAS LIGHT AND COKE COMPANY • CHICAGO

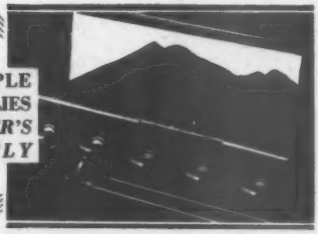
Not the least of the structures ected to industry is the towering gas holder . . . visible t whatever the task . . . if its done with heat n do it better with GAS

Peoples Wins Prize

The six advertisements of The Peoples Gas Light and Coke Company, Chicago, Ill., won first prize for the best institutional campaign at the annual convention of the National Industrial Advertisers Association, in Cincinnati, Ohio, recently. This prize was won in the face of strong competition from many other outstanding national advertisers, The campaign, by its very modernity, bespeaks the spirit of gas . . . the modern fuel

WHY FOLLOW THE SQUIRRELS?

IN THIS SIMPLE GAS BURNER LIES *YOUR WINTER'S FUEL SUPPLY*



"STORE-UP, STORE-UP, STORE-UP!" chirps the squirrel all summer long . . . and thousands of people, who still live under primitive heating conditions, stock up their storage bins or tanks with *fuel* for the winter that is still many moons away.

Not so with those who heat their homes with Gas.

Cold weather may come early or late, and stay as long as it wants to. There are no failing fuel supplies around February or March; no sudden onslaughts on your comfort after you think you have shut down the furnace for the year.

A squirrel is pretty wise—for a squirrel. But he has to depend on nature, and the generosity of the public. On the other hand, your Gas Company for more than a century has served its customers without a single interruption to the gas supply.

May we estimate your heating requirements for this winter? There is no obligation on your part, and the coupon below will receive our immediate attention.

NOTE—Gas is the only available fuel that can be burned smokelessly without human attention or extra mechanical accessories.

Gentlemen: Since it does not obligate me in any way, you may send me complete information about automatic heating for my home.

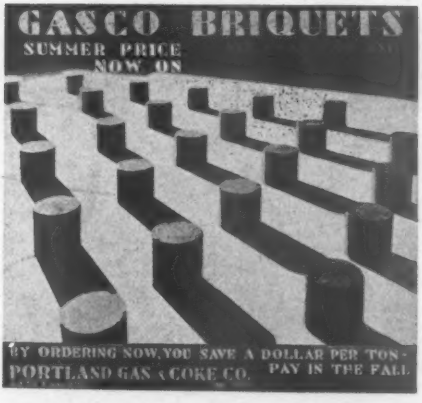
Name _____

Address _____

City _____

NEW YORK & QUEENS GAS COMPANY
MAYNARD H. SPEAR, *President*
114 AMITY STREET, FLUSHING, LONG ISLAND
Telephone: Flushing 5200

EAST RIVER GAS COMPANY *of* **L. I. CITY**
W. C. BOYT, *President*
38-30 BROADWAY, LONG ISLAND CITY, L. I.
Telephone: Ravenswood 6000



That the modernistic trend has caught the attention of the gas industry is seen in the above advertisements. As one commentator has said, "It's a fine thing for the gas company to 'go modern' for the modern idea must be conveyed when advertising gas fuel"

Where the Industry Stands in Research

By WALTER C. BECKJORD

W. C. Beckjord

THE gas industry has been functioning in the United States for something over 100 years. It has made substantial progress in its processes of manufacture and distribution of gas and also in applications of gas to other industries. Like in every other industry, however, it is well to pause from time to time and review the existing situation to see what progress has been made and what development work can be done for the future. Any industry that has been in operation for more than 100 years is apt to have certain elements in it which are based more upon the practice and experience of the past rather than a proper consideration of those factors which deal with the future. The world is constantly changing. Everything in it is changing. The habits and manners and customs of peoples of the earth are altogether different today than they were ten years ago or twenty years ago. Styles of dress change, whether for better or for worse is a matter of opinion, but in general most people will admit that progress is being made. Any industry that does not keep abreast of the times is bound to go backward and the proper way to plan out the future is to base future operations and development on the results of research work.

It is far cheaper to experiment in the laboratory and make plans on paper and have discussions and conferences than to actually spend money on many projects which are not based on proper study and research in advance. This does not mean that laboratory work of itself can accomplish everything because the two must go hand in hand. There are many conditions met with in actual practice that cannot be anticipated in advance. Laboratory work points out the path along which lines of development should take place, but it must be followed by intensive field work and further development to prove the facts. Everyone is familiar with the difficulties which are met with in putting new and untried apparatus into operation. Difficulties are bound to be met with that could not have been anticipated and in most cases the processes are very materially improved by the comments and study of the operating staff, who, necessarily, look at the proposition from an entirely different angle than the research man.

It is not well to draw invidious comparisons but many cases can be shown where industries have not taken proper cognizance of the necessity for research work and have fallen by the wayside as a result. The tremendous development in the transportation industry as a result of the rapid development of the automobile and gasoline propelled buses is an illustration of this. Many traction lines have been abandoned due to economic necessity and even the railroads are revising their schedules in order to meet bus and truck competition.

The tremendous advance in the automobile industry has been based, to a very large extent, upon research work. The larger companies have tremendous investments in laboratory proving grounds on which every new development is thoroughly tried out before put in the hands of the public. This not only proves the commercial utility of an idea but it also helps develop new ones as a result of experience gained on the proving grounds. This development has been to a large extent facilitated by the tremendous concentration of capital which has been engaged in the automobile business and the slogan of one of the largest of these combinations is that they accept the facts developed by research with an open mind and proceed accordingly. They are willing to

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Presented at General Sessions, A. G. A. convention, Atlantic City, N. J., October 14-18.

Mr. Beckjord is Vice-President of the American Light and Traction Gas Co., Chicago, Ill.

cast all tradition to the winds whenever a new idea which seems feasible appears.

The automobile industry, which has constantly developed its product to a higher and higher state of perfection by means of research, is now engaging on an even greater program of research. Some of the larger companies are erecting independent laboratories where research work will be pushed to the nth degree. Diesel engines and Front Wheel Drive may scrap entirely existing models in the next few years.

The tremendous development and rapid progress of the electric industry has been due in a large part to the enormous sums of money spent upon research work. A visit to the laboratories of the leading electric manufacturers will show very highly developed research work. They spend millions of dollars every year in following up new ideas, some of which seem to have little or no connection with the industry itself, but they all fit in to the great scheme of things and the development of one single idea may often pay for the entire cost of research work for years past. Necessarily for any new commodity a market must be developed in order that it may attain commercial success because under the present scheme of things commercial success is essential in order that an industry may survive. The electric industry is a shining example of commercial as well as technical success. Most industrial corporations are organized for the fundamental purpose of making money for the stockholders and in order that they may be successful in developing new ideas they must be permitted to earn sufficient money to pay operating expenses, return on capital and allow something for research and further development of the business.

The tremendous economic development of the whole United States would seem to be proof sufficient for the fundamental soundness of this statement. Certainly the standards of living in this country are higher than they are any place else in the world. The laboring man here is in many cases more comfortable than those of high station in other countries where the standards of living are not so high.

This country has had a tremendous advantage in that the very essence of the principles involved in its foundation were those of radically changed ideas from those which had been in force for many centuries. Progress cannot be made unless the human mind is willing to meet and accept changed ideas and this has been inherent in the broad policies of this country since its inception.

Necessarily, research work for the gas industry involves not only scientific investigation into the methods of production and distribution of gas but also developing new methods of utilization and this leads in to ramification without end. There are few industries, if any, that cannot use gas in some form or another, but money must be expended on a broad and comprehensive plan of research in order to develop new methods of utilization. The contacts and applications of the gas and electrical industries extend throughout the entire range of activities of the human race. It is difficult to find anything which is not more or less dependent upon their operations. Heat is the fundamental basis of civilization and the very slogan of the gas industry is "If it can be done with heat it can be done better with gas."

It might be well to mention here some of the essential differences between the gas and electric industries in order that the necessity for research by the gas industry itself may be understood. The electric industry derives a large part of its revenue from the sale of lamps and other domestic appliances which are manufactured in quantity by the large electric compaines. The constant improvements in the manufacture of these appliances and the ever-widening market of course create a tremendous source of income which can be drawn upon for research work financed by the manufacturing companies. This, of course, is cumulative in its effect, not only in building up great financial strength for the manufacturers but also for the development of the revenue of the utilities themselves. In the gas industry its ap-

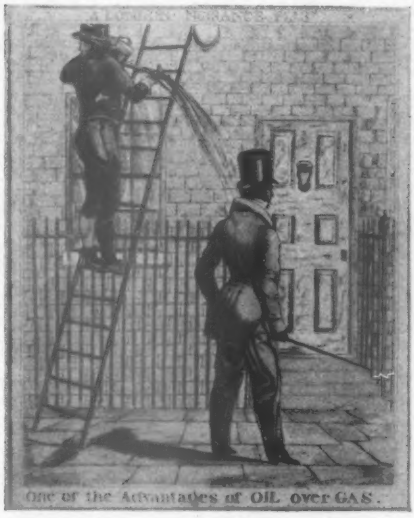
plications are such that this particular field is not open to them; at least it has not been so up to the present time. However, the development of the gas-fired refrigerator is an illustration of what can be done and certainly the research men of the gas industry should constantly bend their efforts to the development of new uses for gas which will popularize it throughout the country.

Great progress has been made in the gas industry in the development of the gas stove and water heater and the central type of heating plant and certainly the gas industry has every reason to feel proud of its present position in the domestic field. The modern gas range is a very scientific piece of apparatus and its heat control is just as absolute and positive as the electric. The modern storage water heater is a very efficient piece of apparatus and it operates year in and year out with very little maintenance. The central type of heating plant is also highly developed and is in use throughout the country. This development has been accomplished by cooperation between the industry and the manufacturers and great progress has been made in spite of the fact that there exist in the gas field no outstanding manufacturing combination similar to those in the electric field. No doubt this will be a development of the future and when that development comes it will put the gas appliance manufacturing industry in the front rank of the industrial organizations of the country. In the very nature of things the smaller company cannot afford to spend as much money on research work as a larger company because its very existence depends upon the necessity for net earnings and these must be carefully conserved. A broad program of research work has been developed by the gas industry working in conjunction with various appliance manufacturing companies and this cooperation has been one of the outstanding developments of the past few years.

In connection with the research work on new methods of utilization of gas considerable thought should also be given to the necessity for research work in the matter of rates to encourage the new applications of gas to industry and for larger domestic use. For instance, instantaneous water heaters have been developed in the past which involve a very high demand thereby increasing the peak demands on the entire system. A new form of water heater has been developed which eliminates this maximum demand thereby earning for this particular class of business a lower rate and incidentally widening the economic field of application for the water heater. Similar situations can no doubt be developed throughout many industries and it is suggested that the research in new applications for gas and rates to meet the situation go hand in hand.

The development of equipment for house heating is becoming an active factor in the sales campaigns of many gas companies. Up to the present time this class of business has apparently not developed to the point where it is a very serious factor in the peak load on manufactured gas distribution systems and plants, but it is rapidly becoming so. Inasmuch as it has many points in its favor and there is a wide public demand for it, it seems advisable to conduct considerable research work to see if the house heating business cannot be developed as an off-peak load by use of heat storage tanks, or in any event taken on at a profit. It may become a more serious peak load factor on the plant than on the distribution system because in the severe winter weather the three-day peak must be considered. Water heating is done in Switzerland by means of hydro electric current at very low rates at off-peak times under thermostatic control and it may well be that this could become a very important factor in building up the load factor of the gas companies and making the house heating load an off-peak load. It is suggested that considerable research work could be done on this and no doubt some of the companies are already considering it. House cooling is complimentary to house heating, offsetting the winter peak. It merits careful study and further research work.

All commercial enterprises are subject to competition. New methods of manufacture



Research has played an important part in developing the industry from the days of these cartoons to the present time. Incidentally, these colored prints were recently purchased by the A. G. A. for its library

are constantly being developed. This has been evidenced in the steel pipe industry, automobiles, moving pictures and many others. The utilities are no exception in this regard. They, too, must accept constant changes in methods of application and manufacture. They must learn to adapt themselves to new conditions, and research work intensively pursued will point the way. Research alone will not solve the problems as it takes courageous leadership, vision, and confidence in the future to make the decision to go ahead. It is one thing to develop facts by research aand another to make the definite decision to go ahead on a constructive basis.

It takes peculiar qualities of mind to engage in research work. It involves a tremendous desire to search for the truth and to follow it no matter where it leads. There can be no predetermined ideas or blind faith in the traditions of the past. Every process and every new idea must be subjected to a pitiless analysis based on the facts and if the idea cannot measure up to this acid test it must be discarded and investigation started along new lines. There can be no reservations whatever if research work is to accomplish its purpose. It will be found that when a given situation is canvassed to develop the facts already existing, more statements of things that are not so will be discovered than real facts. The world is full of mis-statements, perhaps because it is easier to make mis-statements than to investigate the facts, but the research man must be prepared to go all the way.

The organization of the American Gas Association Testing Laboratory at Cleveland has been one of the most important developments in the gas industry and in this respect it has even gone ahead of the electric industry. Originally the Gas Association Testing Laboratory was founded with the express idea of testing apparatus which was to be sold and used by the public, but this idea has developed into a broader treatment of problems now under discussion whereby they do research work on many problems of interest to the gas industry; particularly the mixed gas problem, applications and use of other gases, development of by-products of the oil industry, and now they are engaged in a broad and comprehensive problem of pipe

joint research and pipe corrosion research. The laboratory affords a proving ground, as it were, wherein all problems can be approached from an unbiased standpoint and without prejudice or preconceived ideas. Too often an operator engaged in operating a plant taking up research work is apt to try to prove some ideas or methods that are already generally used. A research man can take nothing for granted. His field is the world and he must follow wherever the facts lead.

A great deal of valuable research work has been done by the industrial gas committee and some remarkable developments in brass melting have been forthcoming, particularly the use of the rotary kiln furnace.

In the Department of Engineering and Research in the University of Michigan, research work has been conducted on forging and decarbonization of steel.

In collaboration with the American Institute of Baking, research work on bread-baking has been done with great success.

Considerable research work has been done on bright annealing, alundum refractory burner and heavy duty broiler, core baking, ceramics, house cooling, and many others.

There is a very definite program for research now under way at the Cleveland Laboratory. The Pipe Joints Research is already started under the direction of an experienced distribution man and the Case School of Applied Science and the University of Pennsylvania will cooperate in this.

The research in corrosion and pipe coverings has been under way since early this spring in collaboration with the Bureau of Standards.

The Mixed Gas Research at the Laboratory will complete its first assignment this year and now work is progressing on enrichment of gas with butane and propane.

The Natural Gas Department is continuing its studies of open flow capacity of gas wells and also measurement of pipe line flow.

Some time ago the industry submitted to Dr. Little at Boston two problems; first, that of providing the industry with a non-poisonous, non-asphyxiating gas, and second, that of finding a way of rendering this gas a more complete product, in the sense of being one which should require no admixture of primary air. This work has been carefully canvassed and discussed and recommendation has been made that an appropriation of $50,000, extending over a three-year period, be made to cover cost of carrying out suggested studies, laboratory tests and reports. This, of course, will involve consideration of the methanation of coal gas and water gas which would have an exceedingly important bearing on the use of oil in gas manufacture. This one factor might entirely revolutionize modern gas manufacturing methods.

Studies are being made now as to increased pipe line capacity based upon high transmission pressure. The gas industry is fundamentally in a very strong position for generating and transmitting energy at low cost. The efficiency of the modern gas plant in producing gas from coal and oil is on the order of 75 per cent and in some cases even higher. This compares with the thermal efficiency of the modern electric generating station of something in the neighborhood of 20 per cent or a ratio of 3 to 1. The ratio of investment cost based on 100 per cent load factor is very nearly as large so that it would seem that there are tremendous opportunities involved in the long distance transmission of energy in the form of gas and development of a gas-fired turbine. Discussion is now under way along the lines of increasing the transmission pressure up to 1500 lbs. and possibly higher.

The use of oxygen in continuous gas making processes and water gas machines is largely based upon the discovery of low cost methods for making oxygen. At present cost it does not seem feasible to use oxygen in gas manufacturing processes, but it may be that better methods will be developed which will make it economically possible.

The coke problem is one that has been with the gas industry for many, many years and research both in the production and utilization of this by-product would be very

(Continued on page 777)

The Monthly Tabloid—Personal and Otherwise

Stuart Cooper

F. B. Hofft

Stuart Cooper and **Fred B. Hofft** have been elected vice-presidents of The United Gas Improvement Co., Philadelphia, Pa., according to announcement by John E. Zimmermann, U. G. I. President.

Both Mr. Cooper and Mr. Hofft have had many years experience in public utility operation and management.

Mr. Cooper, who was born in Clayville, N. Y., in 1887, began his business career with the Syracuse Lighting Co., a U. G. I. subsidiary, in 1905, as a meter tester, where he advanced to assistant superintendent. In 1910 he entered Syracuse University from which he received the degree of electrical engineer in 1914. Subsequently, he was assistant to the electrical engineer of U. G. I., and held important positions with the Counties Gas & Electric Co., Norristown, Pa., and the Charleston Consolidated Railway & Lighting Co., both U. G. I. subsidiaries, of which latter company he was vice-president and general manager, and President of the South Carolina Power Co.

In July, 1928, he became vice-president of the Philadelphia Suburban-Counties Gas & Electric Co.

Mr. Hofft was born in Indianapolis in 1878 and was graduated in electrical engineering from Purdue University in 1902, when he entered the employment of the Indianapolis Street Railway Co. In 1903 he became associated with the Merchants Heat and Light Co., Indianapolis, of which he later became general superintendent, and in 1909 he was made general manager of the Monmouth, Ill., Public Service Co. In 1912 he was made general manager of the Olean, N. Y., Electric Light and Power Co., and vice-president of the Erie, Pa., Lighting Co.

When the Erie Lighting Co. became a part of the Penn Public Service Corp., in 1923, Mr. Hofft was elected vice-president in charge of operations for the northwest region of that company, and in 1927 was placed in charge of the entire Penn Public system—now the Pennsylvania Electric Co.

A. J. Brooks has resigned as sales manager of the Cincinnati Sales Division of the Vacuum Oil Co., to become associated with American Meter Co., at Albany, N. Y.

Mr. Brooks is a graduate of Yale University and of New York University. He has also had several years of technical manufacturing and sales experience with the Gardner Lucas Co., Inc., as factory manager, and as general sales manager with the Herman Behr Co., Brooklyn, N. Y.

Richard J. Clark, until recently general by-product foreman with the Consolidated Gas Company of New York, has become associated with American Meter Co., at the D. McDonald & Co. factory in Albany, N. Y.

Mr. Clark was awarded the Physics and Chemistry Medal at Lehigh University, where he graduated in 1922 with high honors and a Ch. E. degree. Since 1922 his experience includes extensive operating and experimental work with the Bethlehem Steel Corp., the Jones Laughlin Steel Corp., The Koppers Company, and the Consolidated Gas Company.

C. R. Bellamy

W. H. Blauvelt

William Hutton Blauvelt has been appointed manager of gas engineering of the Columbia Engineering & Management Corp.—a subsidiary of Columbia Gas & Electric Corp., 61 Broadway, New York City. For the past seven and a half years, Mr. Blauvelt has been engaged in consulting engineering work, specializing in problems pertaining to coal, gas and oil. During this period he has served many of our leading gas utilities and has taken an active part in the development of the gas business. With the acceptance of his new position, Mr. Blauvelt closes his consulting engineering office at 120 Broadway, New York City.

Charles R. Bellamy, who has been associated with Mr. Blauvelt in consulting practise has joined the organization of the Columbia Engineering & Management Corp. as gas engineer with headquarters at 61 Broadway, New York City.

Affiliated Association Activities

1930 Conventions

THE convention schedule for 1930 is assuming shape, many of the associations already having selected the time and place for their annual meetings. Those selected are:

New England Gas Association,
Hotel Statler, Boston, Mass.
February 19, 20, and 21.

Oklahoma Utilities Association,
Tulsa, Okla.
2nd week in March.

Mid-West Gas Association,
Waterloo, Iowa.
April 14, 15, and 16.

Southern Gas Association,
Savannah, Ga.
April 22, 23, and 24.

Pennsylvania Gas Association,
Galen Hall, Wernersville, Pa.
April 29, 30, and May 1.

Canadian Gas Association,
Halifax, N. S.
June 24 and 25.

Michigan Gas Association,
Grand Hotel, Mackinac Island, Mich.
July 1 and 2

Canadian Gas Association

THE first edition of the Canadian Gas Association List of A. G. A. Laboratory tested and approved gas appliances has been issued as of October 1, 1929. It contains the names of 14 manufacturers and distributors of gas appliances and equipment that have been awarded Canadian Gas Association approval certificates covering tested appliances complying with basic national requirements for safety. The list will appear at intervals of three months.

Copies may be secured from George W. Allen, secretary, 21 Astley Avenue, Toronto 5, Canada.

Pennsylvania Natural Gas Men's Association

THE following committees have been appointed by the board of directors to serve for the year 1929-1930:

Finance Committee: A. J. Newman, chairman; D. J. Hennessy, H. L. Smith.

Membership Committee: Philip Dixon, chairman; T. D. Hann, E. S. Templeton, E. W. Williamson, Geo. Wittmer, III.

Policy Committee: Geo. E. Whitwell, chairman; S. W. Meals, Geo. W. Ratcliffe, E. J. Stephany, J. B. Tonkin, Geo. E. Welker, Geo. Wittmer, Jr., B. H. Smyers, Jr.

Constitution and By-Laws Committee: F. R. Phillips, chairman; T. B. Gregory, B. D. Phillips, E. S. Templeton, Arthur E. Young.

Program Committee: S. C. Preston, chairman; R. D. Beardsley, Reed Cameron, F. B. Jones, P. L. Mulkin, B. H. Smyers, Jr.

New England Gas Association

THE annual convention of this Association is always the first scheduled each year by the organizations affiliated with the American Gas Association. It is the opening gun of the gas association convention season which closes with the national convention in October.

The 1930 annual meeting of the New England Gas Association will be held at the Hotel Statler, Boston, Mass., February 19, 20, and 21. A program committee headed by H. Vittinghoff is at work on a program which will be fairly equally divided between technical and commercial subjects, matters of most timely nature being considered. Men of national prominence are being invited to speak either from the standpoint of authoritative conclusions or speculative trends. In the commercial section there will be some emphasis placed on the necessity of correlating accepted factors of merchandising as a modern necessity of increasing gas sales.

The Entertainment Committee, of which Benjamin Crossman is chairman, will try to introduce some novelties in the entertainment features which have always been interesting and have attracted a large and enthusiastic participation. All in all the plans indicate that the 1930 convention of the New England Gas Association will maintain the high standard set by past conventions.

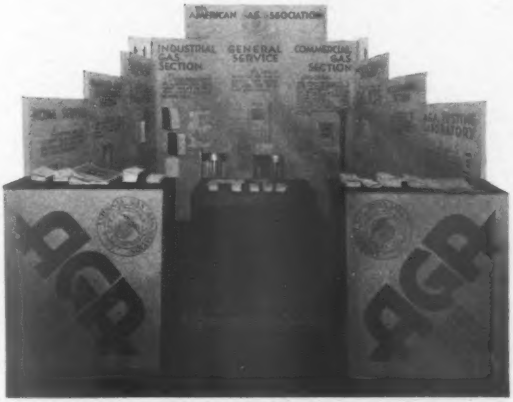
Modernism!

Natural Gas Department

H. C. MORRIS, Chairman — H. C. COOPER, Vice-Chairman

E. J. STEPHANY, Secretary

A. G. A. Has Exhibit at Annual Petroleum Exposition



The A. G. A. booth at the Tulsa exposition

THE American Gas Association exhibit at the annual International Petroleum Exposition, held at Tulsa, Okla., October 6 to 13, attracted a great deal of interest from the natural gas and oil men present. William C. Grant, of the Lone Star Gas Co., Dallas, Texas, and secretary of the Southwest Division of the Natural Gas Department of the A. G. A., was in charge of the booth.

More than 105,000 attended the Petroleum Exposition this year, and it was the consensus of opinion that the exposition was one of the best ever held. Many novel and interesting stunts featured the week, and there was ample entertainment to supplement the business of the exposition.

The purpose of the American Gas Association exhibit was entirely educational to convey to those interested some idea of the services which the A. G. A. renders. Many of the valuable pamphlets, reports, and publications of the Association were distributed to give an idea of the work that is done by the national organization. A great many inquiries regarding the various services were made.

The visitors at the Association booth came from all over the United States and Canada, and there was one from Bakou, Russia.

Mr. Grant reports that considerable interest was shown in the exhibit of the Association, and especially in the literature that dealt with commercial and research problems. Among those attending the Exposition were many of the leaders of the natural gas industry.

Meetings Held in Southwest

A SERIES of meetings were held throughout the Southwest last month in the interest of securing more complete and adequate data, particularly from the natural gas companies, for the A. G. A. statistical reports.

Meetings were held as follows at Shreveport, Dallas, Tulsa, and Kansas City.

These meetings were held by Paul Ryan, statistician of the A. G. A., and Keith Clevenger, director of publicity and advertising. They were attended by representatives of by far the major portion of the natural gas companies of this section, who expressed their willingness to cooperate with Headquarters in the assembling of statistical data, which when compiled will afford a most comprehensive picture of the natural gas industry of the Southwest.

The new art and copy service issued by the Publicity and Advertising Section, replacing the present advertising service beginning the first of the year, was discussed by Mr. Clevenger. Assurances of support of this revised and enlarged service were received at each meeting.

Economic Aspects of Projects

(Continued from page 748)

considerably smaller diameter would be needed. Since the capacity of a pipe line varies as the 8/3 power of the diameter, this means that the diameter of the 2000 lb. line would be only .55, or a little over half the diameter of the 400-lb. line. In order to withstand the higher pressure, however, the smaller line must have thicker walls in the ratio of the products of the pressure by the diameter, or in this case 2.75 to 1, and the ratio of weights per foot of pipe will be this ratio times the diameter ratio given above which would finally amount to 1.5125. In other words, the weight of the 2000-lb. line will be more than 50 per cent greater than that of the 400-lb. line, and the cost of the pipe itself correspondingly greater.

The cost of installation of the high-pressure line would be from 20 to 25 per cent greater than that of the low-pressure line, in spite of its smaller diameter, owing to its greater weight and the extra care necessary in construction due to the high pressure to be carried. The ultimate total cost of the line would therefore be from 40 to 50 per cent in excess of that of a line designed for the lower pressure.

Since it is planned to operate the system under largely increased pressure limits, the power required to secure the higher pressure will be increased likewise, thus entailing a corresponding increase in compressing station investment as well as in cost of operation.

Thus an increase in the pressure limits from 400 lbs. to 2000 lbs. per sq.in. results in an increase in both fixed charges and operating expenses.

This subject has been very ably treated in a paper by P. McDonald Biddison,* who shows that not only is there an increase in the annual charges and expenses due to increased pressure limits, but also that dividing the line into a larger number of sections, thus spacing the compressor stations closer together results in an increased annual cost.

The general conclusion, therefore, is that extremely high pressures are justified only where they "will avoid the selection of a pipe size so large as to entail excessive costs per ton and in those cases where the minimum wall thickness required for rigidity in handling or for successful manufacture allows a higher pressure without increase in tonnage of steel." Close spacing of compressor stations is to be justified only to increase the capacity of a line to keep pace with the needs of a growing market.

In addition to the above objections, very high pressures would probably be attended by many constructional and operating difficulties as well as by an increase in lost and unaccounted-for gas, and a diminished confidence in the dependability of service.

Except in cases where natural gas transmission lines tap large, centralized, proven fields, the extent of their useful life is often uncertain. The large systems comprising networks of lines tapping widely separated fields are constantly confronted with the necessity of removing lines leading from reservoirs which have become exhausted, and re-laying them to newly discovered sources of supply. This process involves not only writing off all of the cost of installation of the line, but also the additional cost of reclaiming the pipe for use in the new location. It is also usually true that new fields are farther and farther away from the markets, the result being that the network of transmission lines is constantly growing and spreading out, even though the business of the utility may not grow. As a consequence the transmission system, like the production system, is required to be maintained at a constantly increasing cost per unit of service rendered.

There are instances where transmission lines at present used for natural gas may in the future be employed for the transmission of manufactured gas, after the exhaustion of the natural gas fields has occurred. In some localities supplies of coal are available, suitable for use in plants located at the mines which are near enough to existing trans-

*"Economics of High Pressure Transportation for Natural Gas Pipe Lines" by P. McDonald Biddison, read before the Southwestern Division of the Natural Gas Department of the American Gas Association, January, 1929.

mission lines to make it feasible to convert the natural gas system to the transmission of manufactured gas.

In cases where the markets for coke and other by-products of the manufacture of gas are far removed from the source of coal supply, it may be preferable to haul the coal to the larger cities now being supplied with natural gas from transmission lines and transmit the manufactured gas back through these lines to supply the smaller cities and towns now on the system and which would otherwise be deprived of gas service with the exhaustion of the natural supply. Furthermore, with the gas manufacturing plants located in the cities, the transmission lines can be used to carry the manufactured gas back to the exhausted natural gas fields for storage as already described. Thus, in many cases it may be possible to extend indefinitely the useful life of such systems.

Distribution System

The general design of natural gas distributing plants differs from that in which the manufactured article is distributed. The pure natural gas system makes no use of a gas holder and requires no storage capacity other than that inherent in the transmission lines themselves because of the high pressures to which they may be packed during off-peak hours. Neither are the distributing lines laid to grade or below the frost line owing to the absence of condensates in natural gas. The differences in practice extend even to nomenclature, for if you were to speak to a natural gas man about a governor, he would think you were talking politics instead of making reference to what he understands to be a regulator. As a matter of fact, the regulator is very widely used in the distribution of natural gas, for it serves to reduce the pressure of the gas at the city border from the widely varying values it assumes throughout the day to the more or less uniform pressure in the intermediate system. This system extends throughout the plant in order to feed into the low-pressure system through many low-pressure regulators. These regulators hold the pressure steady at the pre-determined value of four, six, or eight ounces, which covers the pressure range commonly maintained in natural gas systems. By this method the average size of the low-pressure mains is much smaller than where the gas must be transmitted long distances at holder pressure. A natural gas system is designed usually to carry considerably more gas than is the manufactured gas system, owing to the large heating load supplied by the natural system. Where the manufactured system will distribute from 25 to 40 thousand cu.ft. per customer per year, the natural system will range from 90 to 125, or roughly about 3½ to one. The load factor on the natural system is much less than that of the manufactured, frequently as small as one-half, so that the system must be designed for a peak delivery about six or seven times as large as the manufactured plant. In spite of this fact, the cost of the natural plant per unit of gas sold is as a rule considerably the lower of the two. This, of course, is due to the large increase in carrying capacity with a small increase in diameter, and hence in cost of line.

An intermediate pressure system of distribution is employed in sparsely settled towns where distances are great between houses. This permits the use of small lines, but requires an individual house regulator for each customer. This method of distribution makes gas service possible to communities where the cost of the low-pressure system would be prohibitive. In fact, in many cities this system has recently been adopted where the low-pressure system might have been used, and with the improvement in small individual regulators that has taken place in the last few years this method promises to become more and more popular.

All distribution plants should be built with the thought that sooner or later they will be converted to the use of manufactured gas. This is the division of a natural gas utility which is not necessarily of limited life and consequently even though the cost of construction may be increased by designing the plant for the ultimate distribution of manufactured gas, money will be saved in the long run by so doing for, with the

largely expanding uses for all gases, and the education of the people to the use of natural gas for house heating, it is impossible to believe other than that ultimately none but the smallest towns will be without gas once they have had the service and they will all continue to use it for heating, thus demanding plants comparable in size with those now necessary for the natural gas service they are receiving.

It has already been noted that in the early days of the natural gas industry the value of this incomparable fuel was lightly regarded and the prices asked for it were scarcely worth mentioning. It was but natural, therefore, that no effort was made to put into effect logical rate forms which would impose charges for the various classes and quantities of service in accordance with the costs to produce and deliver them. Our electrical brethren were wiser in their generation, and now we have the unusual spectacle of public service commissions approving sound rate forms in the electric utility field and denying to gas utilities the same form of rates based upon identical principles, and compelling them to make charges which are not only unjust and inequitable alike to the utility and to its customers, but which are also incapable in many cases of producing a revenue which will pay a proper return no matter how high the rates may be fixed. When rates for natural gas were low—say from twenty to thirty cents per thousand for domestic consumption—any increase in the rate was accompanied by a smaller proportional decrease in the consumption so that the gross revenue rose very gradually. With further rate increases a point was reached beyond which any increase produced a larger proportionate decline in consumption with a reduction in the gross revenue per consumer. If the total revenue of a company is not sufficient to pay an adequate return when this point is reached it is useless to attempt to improve matters by any straight meter rate increase as this will drive off business faster than the revenue per customer can grow. Therefore, some other device must be adopted. This has given rise to many attempts to devise a rate which will make proper provision for the fixed charges which have no relation to the quantity of gas sold, and the result has been a great variety of rates the effect of which is to imitate with a greater or less degree of success the results which would be achieved by a scientific rate if it were not forbidden by the discriminatory and prejudicial laws prevailing in some of our states.

Until sensible rate forms are secured by some of the natural gas companies now operating, they cannot hope to earn the revenues to which they are entitled. It has already been pointed out that almost all natural gas companies face an inevitable increase in the unit cost of supplying their service and in order to stretch out their existence as natural gas purveyors to as long a period as possible they should make every effort to get a logical rate form in effect. Already some of the state commissions are beginning to abandon their illogical position in this matter and there is reason to hope that before long it will be possible to put into effect rates which actually bear some relation to the cost of the service rendered.

U. G. I. Announces Expansion Program for 1930

ELECTRIC and gas companies in the U. G. I. system will spend nearly $41,000,000 for expansion of their properties during 1930, or approximately $6,500,000 more than was appropriated for this purpose in 1929, John E. Zimmermann, president of the company, has announced.

"The consumption of gas and electricity for industrial purposes is a good barometer of business conditions," Mr. Zimmermann said, "and the demand for both types of service continues to increase so rapidly in industry, as well as in the home, that all U. G. I. system companies are going ahead immediately with expansion programs. For the past year, gas sales in U. G. I. properties increased 26 per cent. Careful surveys of the territories served indicate that we may expect similar increases during the coming year.

"U. G. I. management is constantly studying rate structures with the hope that wherever practicable reductions in rates can be made during 1930 which will still further increase the volume of business and the net earnings of the various properties."

Accounting Section
J. L. CONOVER, Chairman J. I. BLANCHFIELD, Vice-Chairman
H. W. HARTMAN, Secretary

Gas Sales Increase Eleven Per Cent In September

AN increase of 11 per cent in gas sales for September 1929 as compared with September 1928, is indicated by the first 96 companies reporting to the American Gas Association. As of September 30, 1929, the customers of these companies representing approximately 80 per cent of the industry, aggregated 9,560,000, an increase of 2.4 per cent over the corresponding date of the preceding year.

Gas sales of these companies for the first nine months of 1929 showed an increase of 9.4 per cent, totaling nearly 324 billion cubic feet as compared with 296 billion cubic feet in the corresponding period of last year.

For the month of September 1929 these 96 companies reported gas sales revenues of $33,900,000, an increase of 4.6 per cent over September 1928. For the nine months ending September 30, the revenues of these companies aggregated $308,200,000, an increase of 4.5 per cent over the corresponding period of 1928.

The amount of by-product coke oven gas distributed by the industry continues to increase. During the first nine months of the year the amount of coke oven gas produced by the reporting companies increased 33.8 per cent and the amount of coke oven gas purchased by these companies from coke and steel companies for public distribution increased 29.4 per cent. The total amount of coke oven gas distributed by these companies during the first nine months of 1929 was over 107 billion cubic feet or 30 per cent of the total gas distributed. During the corresponding period of last year, coke oven gas constituted 26 per cent of the total distribution of these companies.

The amount of carburetted water gas and coal gas made in retort type plants continues to decline, due chiefly to the substitution of coke oven gas. This trend is very pronounced among the larger companies. During the first nine months of 1929 the production of carburetted water gas decreased more than nine per cent and the production of coal gas in retort type plants declined more than eight per cent.

Sales of gas in New England in September 1929 were seven per cent above September 1928 and for the nine months period the increase was nearly six per cent.

In the Middle Atlantic States sales in September were 3.4 per cent above September 1928, bringing the increase in gas sales for the nine months period up to two per cent, which, however, is smaller than the increases registered in all other parts of the country.

September sales in the East North Central States were seven per cent above September 1928 and sales in this region for the nine months period were 9.5 per cent above the corresponding period of 1928.

All sections of the country report a very satisfactory increase in the sale of gas to industrial-commercial users. The remarkable rate of increase in the sale of gas for house heating established during the early part of the year has been maintained.

Comparing the nine months ending September 30 with the same period of last year, house heating sales in New England increased 63 per cent, in Connecticut 116 per cent, in Massachusetts 61 per cent, in Wisconsin 65 per cent, in Michigan 59 per cent, and in Illinois 27 per cent. It is probable that larger increases will be registered during the coming winter due to consistent effort of many companies to build up the house heating load.

Card File System

(Continued from page 737)

The system of meter records described above serves many purposes. It furnishes a history of every gas meter—all details, such as meters set, removed, index on each occasion, meters condemned, transferred, and sold, are readily obtainable.

The meter records show the present location of each meter owned by the company. If the meter is active, the address is given, and if not active, its exact status and location are shown.

The system furnishes an absolute check on the "set" and "remove" indexes. Any discrepancies are reported and investigated immediately.

The use of different colored tabs for various sizes of meters affords a ready means of accounting for meters by sizes.

The method of filing the cards according to meter classification provides a control on the gas distribution department's physical inventory. When taking inventory, a loose-leaf record of each meter in stock is prepared and these records are sorted into company meter number order and readily checked with the meter record cards filed in the "stock" position of that district.

The method of filing the cards by districts makes a special audit of active meters in any operating district a very easy matter. It is only necessary to run a list, on cards, of the address plates which are maintained for billing purposes, sort these addressed cards to company meter number, and check them against the meter record cards of that district. This can be done quickly and is obviously accurate.

Separate and apart from the card records, a control is maintained in the meter record department of the number of meters in each of the meter reading books in the local offices. This control is kept by a process of additions and deductions for set and removed meters, to an established figure representing the number of meters in each book as of the date of the last audit.

The figures on this control are checked against the local office meter reading books once each month when the books are in the central billing department at the general office for the preparation of the customers' calls. The count of meters in each meter reading book is obtained as a by-product of a tabulating card system and the total must agree with the meter record summary for that book. This meter record summary, in effect, is a continuous audit sheet.

This check verifies the fact that all meters in service are accounted for and, together with the bill checking operation, insures that a bill is being rendered for each active meter.

At the end of each month a summary of the "sets" and "removes" and of all other changes affecting the meters is prepared for each district and for each operating division. This monthly report shows the number of meters in service and in stock, according to meter classifications and sizes.

The card file system for meter records has not been in operation for a sufficient length of time to establish the exact savings that promise to be effected. It has been definitely established, however, that the card records require considerably less filing space than the bound ledgers. A better meter control, both by operating districts and by meter classifications, has been set up, a definite and immediate control is maintained over the physical inventory, and entries can be made on the records quicker and with less effort than was possible with the ledgers. Further, the value of the system as a time and labor-saver will increase as the number of meters increases. Its flexibility is one of its strongest points.

Ask for Further Questions on Report

THE report of the Accounting Section Committee on Relations with Customers created such interesting and valuable discussion at the recent A. G. A. convention, that it has been thought advisable to ask if any members of the Association have any further questions to ask.

All members are requested to submit any questions they may have on matters contained in the report in the form of a questionnaire. Such inquiries should be directed to E. P. Prezzano, chairman of the committee, who will give all questions his personal attention.

Publicity and Advertising Section
JAMES M. BENNETT, Chairman DONALD M. MACKIE, Vice-Chairman
HOWARD F. WEEKS, Secretary

Advertising As a Utility Function

By ANNA BELLE TURNER

WHEN Henry Ford discontinued manufacturing the Model T and was ready to announce the new Model A, he was naturally besieged by advertisers, armed with detailed descriptions of what they could do for his new product. Into the midst of one of their discussions, Mr. Ford threw a friendly little bomb.

"Oh, you don't need to tell me that," he said. "I know what advertising is."

He continued: "We had a song when I was a youngster. It was called *The Bear Went Over the Mountain.* That's advertising."

Puzzled expressions led him to explain more fully. "That was the whole song," he said. *"The bear went over the mountain, the bear went over the mountain, the bear went over the mountain, to see what he could see."*

It seems almost a desecration to comment on such a humorous nutshellful of advertising truth. But there's so much more to the story than meets the eye at first glance. Repetition of an idea. A picture. Action. And brevity. But above all, repetition.

There's no room for doubt as to that bear's destination.

Mr. Ford's story is chiefly concerned with the method of fixing his message in the public mind. First he had to have a message to give—and he had it in his long-awaited new Ford.

Something worth saying is the prime requisite in any advertising. The more worthwhile it is, the more fascinating is the process for advertiser—and reader.

Now how do we public utility folk fit into that scheme of things? What is a public utility anyway? We've been called different things at different times, depending on mental attitude, political platforms, and on our own behavior. Whoever suggested the term, public utility, instead of gas and electric company, deserves a monument in his honor. "Utility," says our reliable friend Webster, is "usefulness," or if we use the economic term, "power to satisfy human wants," while "public" means "pertaining to the community at large."

A gas company might just be a manufacturer and distributor of gas; an electric company ditto of electricity. But a public utility is the power to satisfy human wants for the community at large—community usefulness. And that certainly is the actuating motive of our industry.

But how many members of a community would naturally think of us in those terms? Not many. They're too busy thinking of their own immediate concerns. The gas or electric company may be to them merely the place where they pay their bills. So we must do more than provide good service. We must tell the public how they can benefit by what we have to offer. It is up to us to interpret our service in its many applications to daily life in our communities. That's public utility advertising.

The beauty of it is that we have so much to tell. If we do our job well, we should be able to create a lively interest, a public appreciation, an increasing volume of business, a decreasing unit cost, and, in this ever-widening circle of benefits, more and more comforts and convenience.

Not so long ago electricity in a home meant lights—and practically nothing else. Now it means lighting, cooking, refrigeration, water heating, and a host of other conveniences.

Gas a few years ago, after electricity

Miss Turner is editor of the "Central Hudson Bulletin" and the "Central Hudson Progress," of the Central Hudson Gas and Electric Corp., Poughkeepsie, N. Y.

Presented at Women's Meeting, American Gas Association convention, Atlantic City, N. J., Oct. 4.

turned off the petcock of its lighting business, had its chief use in cooking. It has continued and improved that service. It has added the ability to heat entire buildings automatically with a complete elimination of handling fuel and ashes. Its sphere of usefulness has also been enlarged by continuous hot water service and mechanical refrigeration. And now gas engineers are working on a gas-operated system to cool our homes when the world's first radiant heater is determined to burst the thermometer.

All this is the fountain-head of our advertising. It's a trite saying that we're doing the customer a service by selling him new equipment. But it's more than ever true today. We can advertise our service wholeheartedly. It seems to me that we have perhaps the best opportunity in the world to speak with conviction and enthusiasm.

Compare our industry with the automotive industry, for example. Their ad writers are enthusiastic, too, and rightly so. But after all, the automobile still adheres to its original idea of transportation via the highway. It has more beauty, more speed, more comfort. But its one purpose, since the time of the first horseless carriage, is still to get you from one place to another by rolling over the ground. Contrast that with the multiplicity of benefits that gas and electricity have brought to the fore in the same period of time.

Yes, we can speak with enthusiasm. But here we need the four-wheel brakes of caution. No statement of ours can be open to the least bit of false implication. We would rather under-state our case than over-state it. Every new gadget that appears, it sometimes seems, is advertised to "revolutionize" the home. The poor American home would have more revolutions than Mexico ever dreamed of. We must measure every statement by the rigid yardstick of accuracy, to create and maintain confidence.

It is in the home, especially, that the versatile ability of gas and electricity can put sixty minutes of usefulness into every hour of their 24 hour day. It is to the home, therefore, that the bulk of our advertising is directed.

For the moment, let us forget the many other channels of advertising and consider the newspaper. Visualize its reception in the home. Before dinner when mother's busy with last-minute duties at the faithful gas range, dad gets his innings with the evening paper with its scare-head streamers, news of national import, sports events, hometown social doings, cartoons. How can we break into his interest so that he'll know our gas furnace is a real news item for him?

After dinner everybody's engaged with his own pursuits, radio going full tilt, brother wants this, sister wants that, and in the midst of it all mother is reading the paper. Fashion advertisements, department store bargains, and cross word puzzles are equal to news in her eyes. How can we transfer her attention from the two-letter word meaning three-toed sloth to all-year refrigeration—meaning good protection?

We must visualize the family we are trying to reach, then dovetail our news—for our commodities have a real news value—into the daily happenings of that family. As George P. Metzger says in that masterpiece of his called *Copy*:

To sell John Smith what John Smith buys
You must see John Smith with John Smith's eyes.

We spokesmen for the public utility must also remember that while our main job is writing copy, it is not our customer's main job to read copy. We must make our message direct and to the point—short but often—that is where repetition comes in. A little copy now and then is relished far more than big doses.

Repetition, however, without variety becomes as monotonous as a mosquito's solo on a hot night. Here again we public utility people are sitting on top of the world. Not only have we a variety of services to offer; we have many means of focusing John Smith's attention on them.

In more ways than one are we a community enterprise. The gas and electric utility today joins hands with agencies which were considered competitors in the dark

ages before cooperation was truly understood. Our company, for instance, has a close hook-up with the electric leagues in broadcasting the value of adequate wiring. More than that, we have a cooperative merchandising and financing policy. Any reputable electric appliance dealer and plumber may sell the same merchandise we have in our salesrooms, or may sell other reliable makes on convenient terms and turn over the paper for us to handle.

Our advertisements carry the slogan, "Ask Your Own Plumber," and "Ask Your Own Electrical Appliance Dealer." We help them —they help us. Every dealer who becomes a business partner of ours on those terms is spreading our story over his field of operations. "Ask the Man Who Owns One" applies to water heaters as well as to Packards. The old myth of the saturation point has sneaked into its dusty corner. Selling appliances today is building tomorrow's markets. The world is growing.

So far we've considered only newspaper advertising. Effective as it is, the newspaper is just one medium among many for the public utility. Our mailing lists are always up-to-date. The flip cartoons about sending mail to infants in arms and graveyard addresses do not touch us. Our billing lists are automatically revised. Direct-mail is a willing ally.

But here opportunity and disaster may walk side by side. We may overwork this willingness and bombard our customers with expensive broadsides that only make a speedy non-stop flight to the waste basket. But bill inserts can take this risk, if they are attention-compelling. The bill has to be sent, it will be opened, and the insert may easily get in a word or two. Other more costly direct-mail does its best work when addressed to a selected list where we know there is some fertile ground for our idea to sprout. Industrial and commercial advertising through its limited appeal is best handled this way, also.

Then we have window displays—showroom displays—special exhibitions. They all repeat our story and add that variety which spices the life of advertising. These,

There Is Still
A Hot Water Famine
in *hundreds* of Albany Homes
ALTHOUGH city water service was resumed last Thursday, hundreds of homes in Albany and vicinity are without the comforts of constant hot water service. This situation can easily be corrected.
Realizing that constant hot water service is as important as cold water for real home comfort, your local plumber and gas service company are prepared to install immediately a "Keep Hot" Water System in your home.
The "Keep Hot" Water System starts itself. It stores hot water. It stops itself. It keeps "piping hot" gas heated water stored in a thermos-like tank.
AUTOMATICALLY this hot water reservoir answers every hot water call. *AUTOMATICALLY* it guards against hot water shortage and delays.
AUTOMATICALLY it keeps hot water constantly ready to flow at the turn of the faucet.
Can you imagine a more important service? "Keep Hot" Water Heaters are bringing hot water convenience to hundreds of Albany homes. For less than the cost of a package of cigarettes a day you can enjoy real hot water comfort and convenience in your home.
Let us tell you the very low cost and easy terms available for constant hot water service.
At your plumber or our local store
NEW YORK POWER AND LIGHT
FARRELL BROS.

Certainly this newspaper advertisement tells the story of service rendered by the gas water heater

too, are cooperative in our company. Dealers and plumbers are mentioned in our windows and displays are furnished to them.

And there is the demonstration home where Mr. and Mrs. John Smith and the little Smiths get a life-size view of gas and electricity in their up-and-doing tasks about the home. A cooperative project linking many business interests.

Models of homes and farms, built in miniature and completely outfitted, make an exhibition at a county fair something besides a place to dodge everlasting folders.

Home service, though not strictly classed as advertising, certainly says it with advertising results and finds a way to the public's heart in a method long known to womenfolk.

Variety in repetition. The public utility has nothing else but.

Now for that other classification of adver-

tising, distinguished from merchandising by the term "good-will," "institutional," or "general." Many of these ads are indeed general, far too general. They should be as definitely local and personal as our merchandise advertising. Here, too, we are interpreting the company with a view to selling—not a water heater or range, but the service that makes them function efficiently.

You can find both good and bad examples of this advertising in your memory. The kind that makes the gentle reader say: "What do I care if they did manufacture um-te-ump million cubic feet of gas?" And the kind that makes him feel, "It is my comfort that those fellows are working for after all."

Our company has concentrated on a monthly news sheet as a messenger to carry knowledge of company activities that bear directly on our customers' daily life. The national yearly send-out may mean less than nothing to them. But the announcement of our new high-pressure gas main, bringing new conveniences to suburban territory, finds a responsive audience. A small affair of four pages, printed in two colors, our publication, the *Central Hudson Progress,* carries a diversity of subjects through the year; home service programs, community projects, rural electrification, household suggestions, construction feats, actual installations in our territory, and tie-in publiicty with merchandise activities. One page is always utilized for a merchandise advertisement in which plumber and electrical dealer are now given a share.

Into every home on our electric lines and gas mains this publication goes. And we have good evidence that it is being read.

Then there is advertising that reaches our customers, but does not reach advertising accounts. Our service men, our salesmen, our linemen, our construction trucks and crews—they're an advertisement to our public in the course of their regular work.

All in all, advertising in a public utility is a friendly get-together between company and public, with the company on the reception committee.

We know we have something worthwhile to offer. There is a ring of sincerity to our advertising because we are sincere. We not only have to see with John Smith's eyes, we have to like John Smith. And we do.

Key to Coal's Treasure

(Continued from page 751)

This is but the beginning of the scientific miracle. It is as far as the by-product coke industry goes. It has made five products, namely, coke, gas, tar, ammonium sulphate, and the benzols. Each of these has very important direct uses on a large scale. We have made coke—modern coke, the least expensive of all smokeless solid fuels. We have also made ammonium sulphate, a valuable fertilizer for orchard and farm. But we have not yet brought forth dyes, perfumes, drugs, and a long list of other valuable products. These are produced from the crude products by the great chemical industries as the result of a vast amount of scientific research. They take the black and rather evil-smelling coal tar, distill it, separate it into its many constituents, purify these and make from them many substances. They take the benzols, which are liquids somewhat resembling gasoline or kerosene, and from them make thousands of compounds. Some of these were the most important high explosives used during the World War, including the well known T.N.T.

Looking back over the centuries to Winsor's time, we identify his crude teakettle gas plant as the forerunner of our great modern by-product coke plants.

Today, modern science looks out upon a smoke-infested civilization, as did Murdock and Winsor of old, and implores mankind to heed the fuel lesson of the ages—stop burning raw coal, which pollutes the atmosphere of your great cities. Carbonize it, distil it to recover its marvellous smokeless fuels and its wonderful by-products.

That is the province of the by-product coke industry. Its capital resources, its man power, and its plants are all devoted to the great project of making coal yield up the accumulated savings of the energy received from the sun millions of years ago.

Manufacturers Section

F. G. CURFMAN, Chairman E. S. DICKEY, Vice-Chairman
C. W. BERGHORN, Secretary

Heating the World's Largest Market

(Continued from page 732)

uce rooms needed only 32° F. temperature day and night on some days. But when the outside temperature was above freezing, the produce rooms needed no heat whatever. In fact, temperatures above 32° F. are unfavorable for fresh produce.

Obviously, the outside temperature on the majority of days when the offices needed 70° F. was above freezing, as is proved by consulting the following temperature record for the winter of 1926-27:

RECORD OF WEATHER IN CHICAGO

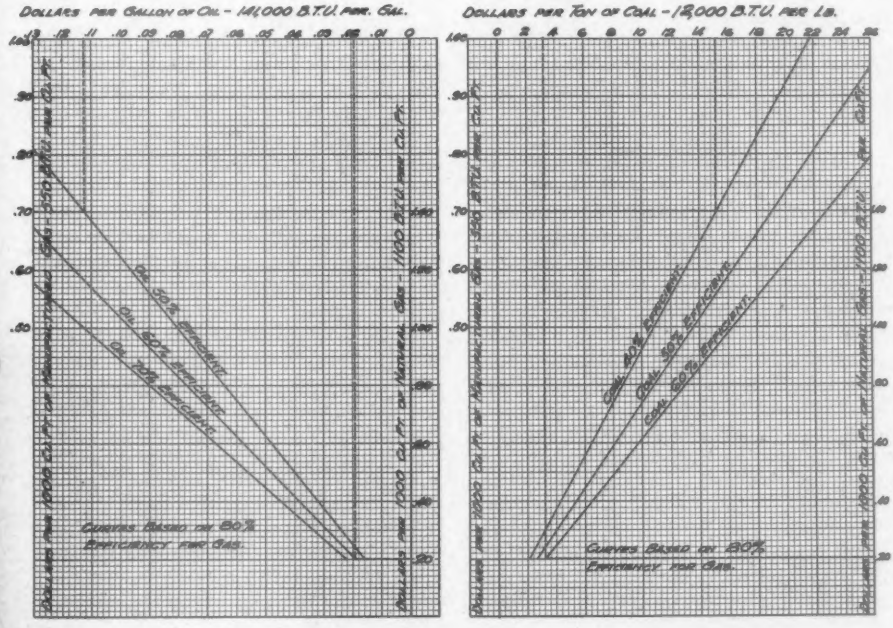
October 1, 1926 to May 1, 1927

Indicating heating requirements of the South Water Produce Market—as reported by "Heating & Ventilating Magazine."

Days from October 1 to May 1

Averaging below 70°	209
Averaging below 32°	68
Averaging between 70° and 32°	141
Days when offices in South Water Market needed heat	209
Days when produce rooms needed heat	68
Days when offices required heat, but when produce rooms did not	141

The above record indicates that on 141 days, or 67 per cent of the days when the heat was necessary for the offices, no heat was needed for the storage rooms. Any heat delivered to the latter would be not only wasted, but deleterious for the fresh produce. Furthermore, during the 68 days when heat was necessary for the produce rooms *24*


DOLLARS PER GALLON OF OIL - 141,000 B.T.U. PER GAL.
DOLLARS PER TON OF COAL - 12,000 B.T.U. PER LB.
CURVES BASED ON 80% EFFICIENCY FOR GAS
CURVES BASED ON 80% EFFICIENCY FOR GAS

Curves showing relative cost for gas and oil, or coal, using gas steam radiators

hours a day, heat was needed in the offices only *10 or 12 hours a day.*

The situation demanded a heating system such as gas fuel and unit control alone could give. With gas steam radiators it would be possible to get heat where it was wanted, when it was wanted. And the only attention necessary was the turning on and off of the radiators. Another advantage of gas steam radiators was that they could not be damaged by freezing, since there is ample space in the water compartment of a gas steam radiator to provide for the expansion of ice. With the low temperatures commonly occurring in some of the intermittently heated storage rooms, this is a real factor. A water-logged central heated steam radiator or boiler subjected to these low temperatures would be in danger of bursting.

Vented gas steam radiators were recommended for heating the offices in the market, and unvented radiators for the storage rooms because moisture is no consideration. The fan draft system was installed in a number of sections. The vented gas steam radiators are placed along front walls and the vent pipe from each is run down through the floor where it connects with a main vent line or manifold. An exhaust fan draws out the products of combustion, discharging them into the outside air.

Heating costs during the first two winters have definitely proved that a unit controlled gas heating system, such as gas steam radiators, reaches a market for manufactured gas sales which cannot be reached by central gas heating systems. Besides the thousand or so gas steam radiators in the South Water Market, there are three central plants, heating four sections. The average cost of heating thirteen representative sections in the market with gas steam radiators was computed to be $155.48 per year. The average cost of heating four representative sections with gas-fired central steam heating systems was $492.01 per section.

While the above figures do not give an exact comparison, there is enough difference to warrant the conclusion that unit controlled gas heating devices of this type can be operated at less cost in certain types of buildings, chiefly those requiring only intermittent heating. In buildings needing continuous heat in every room as in residences, the difference might shrink to almost nothing. Among other classes of buildings with intermittent heating requirements which can be heated with manufactured gas at a price comparable with that for crude fuels are stores, churches, factories, and offices.

The curves show comparative costs for heating buildings of these classes with gas steam radiators and with central heating plants using other fuels. The figures used take into account the purchase price of the fuel only. No allowance whatever is made for janitor service, installation costs, and the costs of providing space for the boiler and fuel storage, all of which would be in the favor of gas.

Announce New and Enlarged Art and Copy Service

THE A. G. A. 1930 Art and Copy Service will make its initial bow to the industry in December.

The aim of the new service is to enable the advertising representatives of every gas company to keep apace of the constantly increasing growth of the industry in volume as well as quality of service rendered.

Art work has been improved. Lay-out has been given more attention. Above all, customer desire for the ultimate degree of comfort, convenience, health, and enjoyment of the home and increased economy and efficiency in gas utilization—the ends to be secured by the use of gas rather than the mechanical means—will be featured in the new service.

In addition to the suggested advertising copy and illustrative service, a group of typical advertisements of other gas companies will be included in the service each month, as well as outstanding advertisements of competitors in the fuel field. At regular intervals a number of samples of direct-by-mail advertising, used successfully by gas companies, will be enclosed with the monthly service. The use of all or any part of the illustrations and text of these direct-by-mail samples may be had upon application to the Publicity and Advertising Section of the Association.

The service will be issued in duplicate and handsome leather folders with capacity for two years' file of the service will be supplied to each subscriber to the advertising service at cost.

Industrial Gas Section

C. C. KRAUSSE, Chairman D. W. CHAPMAN, Vice-Chairman
C. W. BERGHORN, Secretary

Modern Salesmanship Defined

By FRANCIS W. GOODENOUGH, C. B. E.

IT is a peculiar privilege and pleasure for an Englishman to address a body of American citizens in these historic days. Across the ocean which no longer divides but for the future unites the two parent branches of the English-speaking family, two plain men of transparent sincerity, two great statesmen, have together lighted a lamp of hope for the whole world which, please God, shall never be extinguished.

To speak of salesmanship before an audience of Americans savors somewhat of carrying coals to Newcastle, for America is the home of discussions on salesmanship; but that very fact may also be an excuse for my doing so, as our American friends may be interested to hear how we regard the subject, which is much to the fore in our commercial circles today—and I, at any rate, shall be very glad to hear from them their criticisms of our views.

First of all let me say that by salesmanship I understand—and the committee, over which I have the honour to preside, that is considering the question of education for salesmanship, understands—not merely the art of the salesmen on the road, behind the counter or in the showroom or exhibition stand, but the whole business of marketing goods or services from the point at which they are produced to the point at which they are utilized.

In our view, salesmanship embraces the study of the fundamental principles and the planning of policy based upon them, as well as the selection, training, direction, and performance of the personnel required for translating policy into effective action. In other words, salesmanship covers the creative, organizing, and executive aspects of commerce, of which it is the very heart and life-blood. Commerce has for its fundamental purpose the marketing of goods or services to the mutual profit and lasting satisfaction of both buyer and seller. All that pertains to the fulfilment of that purpose is the business of salesmanship in its widest sense.

From this you will see that I regard the headquarters of every undertaking as the vital point at which is determined the success or failure of its salesmanship. Unless the importance of efficient selling policy, based on sound commercial principles, and carried out by an adequate staff of well-trained men and women of the right type, properly paid, is realized to the full by the directors and managers of a business, the best efforts of the best star salesman will ultimately fail. The buying, producing, and delivering organizations of any firm must all be directed and co-ordinated to the end of giving the customer what he wants when he wants it and how he wants it, if the salesman is to function successfully and the turnover and profit are to increase.

As we have seen, salesmanship is a matter of principle, policy, and personnel. If all three are sound, they result in satisfactory service which alone is the basis of enduring good will and permanent profit. And the foundation obviously is principle.

Principles are universal and invariable. Truth, honesty, justice, patience, sincerity, reliability, friendliness—the ingredients that go to make up the principle of service first, which after all is but the Golden Rule in practice—know no nationality and no changeability. They are world-wide in their application and available at all times in unlimited measure for everyone to adopt and build upon.

Mr. Goodenough is President of the Incorporated Sales Managers' Association, and is with the Gas Light & Coke Co., London, England.

Presented at American Chamber of Commerce meeting, London, England, Oct. 15, 1929.

Americans are perhaps more given than we are to talking about the importance of service as the basis of all truly successful commerce. We Englishmen, I think, are too prone to take it for granted that everyone realizes the fundamental importance of the everyday conscious and conscientious application of that principle in every detail of our daily business life—though that is very far from being the case. But it has been on that principle—the principle of the square deal, of our word being as good as our bond, and our performance equal to our promise—that our great commercial edifice was built up in the past, and only by its more general adoption and application can that edifice be maintained and enlarged in these days of increasingly strenuous competition in all the markets of the world.

Policy of course varies with the individuality of individuals even though they are putting into practice the same principle. Policy, to be living, must have elements of initiative, enterprise, experiment, adventure, and in the course of development mistakes are inevitable—but they are not likely to be grave or beyond remedy if the foundation of the policy is right. The vital thing is that we should always have standards by which to judge proposed lines of action, that the principle of service first should become part and parcel of us so that no line of policy is determined upon without its guidance, conscious or automatic, and so that we are never led into shady practice by the old idea that "business is business"—and the devil take the hindmost. Business—the business of selling—to be worthy of our busyness in it must not be regarded and conducted as a contest between men out to best each other but as a form of mutual service for mutual profit.

Policy in salesmanship, apart from individual variations, does not differ in our two countries, America and England. The best business men, the most successful business men, in both countries frame all their policy on studying the needs, habits, tastes and wishes of their customers and doing their utmost to meet them at the right time, in the right way, and at the right price. I was much interested, in reading some time ago that very interesing book, "Men who are making America," to note how many of those men ascribed their success to a policy of satisfying the customer. Said Mr. Shand, the head executive of Marshall Field: "I took so much pleasure in pleasing customers that I knew I was born to be a salesman." And that was typical of all these big business men.

That brings me to the question of personnel.

Is the salesman, like the poet, "born not made"?

"Yes," to the extent of being born to be a salesman, that is with the right personality, the right disposition, the flair for winning and keeping the attention and confidence of the potential customer. "No," in the sense that the most promising material needs education, training, and shaping before the perfect article is produced.

As well say that a Sheffield razor is born not made, because the best one is available for transformation by furnace and forge and grindstone into the sharp-edged tool, as say that the perfect salesman does not need the furnace and forge and grindstone of education, training and experience to fashion him out of a promising personality into the sharp-edged tool of commerce.

It is in the degree of their recognition first of the need of highly skilled salesman, and second of the impossibility of producing them in adequate numbers without proper organization for their education and training that America and England differ today. We for so long got business the world over without serious effort, because we were the first in the field and our goods and our methods of trading were of high quality, that we have been slower than our friends across the water in realising the importance of salesmanship in the whole wide sense of the word—have kept our brains too closely concentrated upon production and finance and not sufficiently on marketing—and have been slower in recognizing the need for highly skilled salesmen to sell the products of our factories.

(Continued on page 776)

Commercial Section

G. E. WHITWELL, Chairman — E. R. ACKER, Vice-Chairman

J. W. WEST, Jr., Secretary

Announce First Natural Gas Regional Sales Conference

IN Pittsburgh, early in February, probably the 10th and 11th, there will be held the first Regional Sales Conference that has included in its scope natural gas properties exclusively. This conference will be similar to the Regional Sales Conferences which, during the past few years, have been sponsored by the Commercial Section of the American Gas Association and successfully conducted in the various regions served with manufactured gas.

It is planned to make this first Natural Gas Regional Sales Conference helpful not only to those charged with the responsibility of actually selling natural gas, but also to all others connected with the industry who feel the desirability of a frank discussion between operators and salesmen of the selling problems which at no time in the industry were ever more important than at the present.

This first Natural Gas Regional Sales Conference, sponsored by the American Gas Association, is planned to include in the conference representatives from natural gas properties in the states of Ohio, West Virginia, and Kentucky, and from the western districts of Maryland, Pennsylvania, and New York. This district has many sales problems that are characteristic and, in some cases, unique, and the sessions of the conference will be devoted primarily to these special problems.

It is planned that a considerable portion of the program will be devoted to those cooperative phases of the natural gas business which are so essential to its ultimate success. The interdependence of the sales and operating departments will be stressed in the hope that the program can be made attractive to others than those who are immediately identified with selling activities. Similarly, the dealer problem will not be forgotten because, probably to a greater extent in natural gas than in manufactured gas territory, the dealer plays a most important and extremely valuable part.

Special features will be provided for the industrial gas men and for women who are engaged in home service or merchandising activities.

Merchandise Accounting

(Continued from page 745)

At best the accounting classification submitted can be looked upon, therefore, only as a start in the direction of real uniformity. There remains the process of refinement, to develop and determine through close comparative study conclusions in respect of some of the controversial items which will represent a generally accepted consensus of opinion.

These accounting differences are not deep-seated, however, and are susceptible of being ironed out, I believe, without difficulty upon detailed consideration of the transactions affected. To be frank, the committee has not attempted during the past year to pass finally upon all of these accounting questions, as they seem academic in the present diversity of merchandising policies existing among the companies.

There is a further phase of this question which I wish to bring to your attention. To me, this suggested outline of accounts for merchandise sales, although it follows the conventional form in general use today, does not seem to be the complete answer to the problem undertaken by the committee. We have but half of the picture if we look at the financial results of merchandise sales as something apart from new business expenses. Most of the items of indirect cost

are at least in part new business expenses. Not all of salesmen's salaries and commissions, for example, apply to merchandise sales. We should not ignore the responsibilities of public contacts and as salesmen of gas which form a part of salesmen's duties and take up an appreciable part of their time. As another example, there is no standard practice governing the distribution of advertising between merchandise sales and new business expenses.

These items will suffice to show that the results of merchandise sales, which are necessarily based upon arbitrary apportionments if considered apart from the balance of the related costs, will represent but artificial figures reflecting the skill of the apportioner rather than the skill of the sales department. Only the totals of expenses incident both to appliance sales and to new business expenses can be established as an actuality.

For the complete picture I believe the results should be shown in such form that the merchandise sales and new business expenses are brought together, and that both are related to the total volume of gas sales and to the added load estimated to have resulted from the entire efforts. The committee has barely touched upon this subject in the present report. It remains for further study of the most effective method of presenting this picture, and depends, of course, upon the questions of policy already discussed.

In closing, may I express the hope of executive interest and consideration of this question. The subject cannot be disposed of as an internal problem of the industry, regarding which each company may follow the dictates of its own views. We have had in the recent past many evidences of the lack of understanding on the part of the public generally of the problem of the utilities in marketing appliances and of the obligations of the companies for the future development of the business in the common interest of the customer and investor.

In spite of differences in state laws and in company charters, the public interest in this question seems to indicate the desirability of an industry-wide policy which will reflect the true economic picture of the merchandising activities by the utilities.

If we can enlist the attention and interest of the industry toward a general recognition of the close relationship of merchandising to promotional activities, and evolve some universal acceptance of that fact, we will bring about, I believe, a constructive service to the industry, and will incidentally remove one of the chief obstacles now confronting the committee in the accomplishment of its assigned task.

Modern Salesmanship Defined!

(Continued from page 774)

That most amusing, but also most instructive, *jeu d'esprit*, "The Great American Band Wagon," in which an American makes fun of Americans in respect of their exuberance of action in every walk of life, is especially amusing on the eubject of the American craze for college and correspondence courses in every conceivable subject, from banking to beekeeping, and commerce to cremation; from house decoration to Homer, and from apartment house management to elementary celestial mechanics; from milinery to the general morphology of the bryophytes and pteridophytes. But behind all this amusing exuberance and thirst for something new and different, there stands the great fact of the love of America for knowledge and the power it brings, and, especially, the widespread realization of the fact that the great calling of commerce demands for its truly successful pursuit, on sound principles and through efficient policy, an extensive, well-educated, soundly trained, and keen personnel. We, in England, while not making the mistake of thinking that American methods of salesmanship are all best suited to British markets—nor the equal mistake of forgetting that they may be well suited to many neutral markets in which we want to sell British goods—are I hope rapidly learning, as we have got to learn, that recognition by every business house in this country of the vital importance of scientific salesmanship and the need of skilled salesmen, to the full extent of its recognition in America, is essential to our future progress as an industrial and commercial nation.

Technical Section

HARRY E. BATES, Chairman B. V. PFEIFFER, Vice-Chairman
H. W. HARTMAN, Secretary

Where the Industry Stands in Research

(Continued from page 758)

valuable. For several years past a plan has been suggested whereby the Bureau of Mines of the United States Government would undertake a very thorough research on American coals involving consideration of their gas-making qualities as well as coke-making qualities. So far no appropriation has been secured from the Government to further these studies, but it is to be hoped that some progress will be made in the near future. Certainly research on production, utilization and sales of coke will be very valuable and is very vital to the industry. It is recommended that careful consideration be given to this in any plan of research for the gas industry.

A manufacturer who is engaged in developing business must of necessity be prepared to meet competition from other manufacturers in the same line, and to do this properly he must scrutinize his manufacturing costs with exceeding care. In many cases he can well afford to use a higher priced fuel for heating processes in order to speed up manufacture or to secure a better product because in the last analysis a better product will always command a higher price if it can justify the added expenditure. In following the developments of the application of gas the research man must become intimately acquainted with all the problems of the manufacturer whom the industry serves and this applies to every branch of the industry.

Tremendous sums of money have been spent upon development of processes for the complete gasification of coal, both in European countries and in this country. Progress has been slow and some of the developments are dependent largely upon economic conditions of which the gas industry is only one part. Production of light oils from coal will be dependent largely upon the competitive market in the production of petroleum and its by-products. Until such time as they may justify themselves on a competitive basis it will be difficult to make processes which have been developed for this purpose a commercial success. These matters must take their course. It is evident that light oils can be produced from bituminous coals, but when considered in competition with petroleum products which are taken from the ground they cannot hold their place in the present competitive market in this country. The time may come, of course, and undoubtedly will, when such products will have their place, but there is no point in attempting to batter down a stone wall of economic competition. A number of commercial plants have been built involving production of light oils and coke, notably the one at New Brunswick, New Jersey, by the Combustion Engineering Corporation, and this development will be watched with great interest by the industry at large.

One of the material factors in cost of production and one that is often overlooked by the engineer and research man, is fixed charges. It should be the constant aim of every engineer to reduce the investment cost, both in production plant and distribution systems. Much has been done in getting greater capacity out of existing apparatus by improvements in design and a great deal of gas main extension work is now being accomplished by high pressure transmission networks. Many of the suburban extensions, which in time may be the larger part of the distribution system, are being taken care of by high pressure steel mains using individual service governors, and this will ultimately fit into long-distance transmission networks.

However, in addition to these changes, there is one feature of construction that merits the undivided attention of all engineers for its possibilities are great, and that is outdoor construction. There has been a gradual development in building holders,

purifiers, condensers, coke ovens, etc., out of doors, but surely more can be accomplished. It is not to be expected that apparatus designed for indoor operation can be put out of doors in all climates and operated without trouble, but a start must be made sometime. The first attempt may even cost more but in time success will be achieved and the field to work on is broad. Fixed charges probably constitute from one-third to one-half of present production costs. There seems to be considerable prejudice on the part of many operators toward outdoor construction on account of minor difficulties based on old methods, but with a commonsense attitude they are certainly susceptible of analysis. The electrical industry has made great progress along these lines. Hydrogen cooled motor generators are now in operation. Hydro-electric generators are being built with only sheet iron coverings. The generator end of steam turbo-generators will presently be offered for outdoor construction.

Boilers and water gas sets of relatively crude outdoor design have been successfully operated in the colder parts of this country. In Germany enormous gas machines built out of doors like blast furnaces are making blue gas out of pulverized lignite with as much capacity in one hour as our machines have in twenty-four.

Present plant design still leaves a large field for outdoor construction. The possibilities are tremendous. It is urged that research men and engineers give serious thought to these possibilities and approach the problem without prejudice.

In view of what Henry Ford has accomplished in the automotive world with his announced policy of ignoring precedent, might it not be well for gas engineers to sometimes view their problems from the standpoint of one who knows nothing whatever of the details of the gas business and for that part of the working day at least which is devoted to planning for the future give consideration to new methods of production, distribution and utilization which are not necessarily founded upon past precedents?

In various parts of the United States numerous transmission pipe lines of large capacity have been laid in the past, carrying natural gas long distances, in some cases upwards of a thousand miles, and more are being projected for the future. In those districts where the natural gas pressure is decreasing, manufactured gas is being mixed with it, to conserve the supply and give uniform service. In time to come this will undoubtedly be the condition all over the country and super gas plants larger than anything now contemplated may become a development of the future to supply existing transmission networks with 100 per cent manufactured gas. A gas plant does not require the enormous quantities of condensing water that the electric plant does so the usual scarcity of water in the mining districts will not be a limiting factor. The tremendous lignite deposits in various sections of the country will become an active source of supply such as has already been developed in Germany and methanation of blue gas may become a reality. It may even be possible to supply gas from these sources to large electric plants either as boiler fuel or fuel for gas-fired turbines which development may revolutionize the power industry. It seems entirely possible that the gas industry may become the primary source of power, and electricity the means of transmission and adaption to ultimate use. All this emphasizes the very great importance of continued mixed gas research at the Cleveland Laboratory and the investigation and development of newer kinds of gases resultant from reforming or mixing those already known.

Research does not only involve gas manufacturing and distribution processes but it should and must be applied to other branches of the industry as well. Research in its broadest scope will take up problems of accounting, office management, methods of handling customers and public relations, and also methods of finance and planning for the future. Of course, some of these matters in the last analysis may resolve themselves to a matter of judgment, but certainly a great deal of progress can be made by applying

the same fundamental principles to all lines of the gas business as is being done in the research laboratory in development of new processes of manufacture, etc.

It must be remembered that the industry must function along the lines for which it was organized and that while the development of new ideas is desirable and essential they must be put into effect carefully so as not to jeopardize the financial condition of the industry. Some radical changes in the style of women's clothing, for instance, have absolutely wrecked some of the textile industries and the same might be true of the gas industry where changes that are too radical are put into effect. Progress along these lines must be made slowly and reason must be tempered with judgment. It must not be felt, merely because a new process has been developed in the laboratory which looks good on the surface, that necessarily the gas business must be completely revolutionized. Progress can be made slowly and effectively and each year contribute its measure of improvement to the sum total of our progress.

In any particular discussion there usually can be as many reasons advanced on one side as on the other. Few propositions are so clearly defined that the reasons for going ahead are all in the affirmative. In the last analysis most propositions must be decided on that judgment which is essentially based upon past experience, power of analysis, courage and confidence in the future. It is difficult, if not impossible, to derive any formula by which any proposition can be tested and found correct or proven wrong.

Likewise, problems can never be solved by ignoring them. Each new development of the business should be followed through to its logical conclusion, if possible, as analyzed in the light of all other knowledge which we have obtained on the subject. If a conclusion is arrived at a decision should be made because progress depends upon decisions and not upon a policy of procrastination.

The success of most industries is based upon an all-abiding confidence in the future and a proper analysis of the relation of that industry to the whole economic structure of the country. Any one industry cannot be out of economic proportion to conditions in the country at large. For instance, it would be unwise to manufacture more automobiles than could possibly be used by the people, but the number of automobiles which can be assimilated and used by our population has expanded to a surprising degree.

While it may be a logical procedure that the engineer, by reason of his technically trained mind, is the one to whom research work should be assigned, it does not follow that research work is essentially an engineering matter. Results of research must be considered in the cold light of business analysis as well as thorough consideration of the facts involved because the success of any business does not depend entirely upon theoretical considerations, but upon the practical application of the facts based upon a thorough study of their effect, not only on the various branches of the gas business but on the outside public and industry as well.

It is sometimes difficult to coordinate the efforts of a number of men and companies operating in different parts of the country because sometimes local conditions make for differences which are hard to overcome. However, the theoretical laws of nature are the same in all parts of the country and if after an analysis of the economic conditions the proposition developed by research looks commercially feasible a decision to go ahead should be in order, as progress can only be made if constructive work is carried out year after year.

Of necessity no association can of itself carry all the expense of research work and development. Some of this work must be done by the companies themselves because they are better able to carry on the expense of such work on account of its more direct application to their own situation. Very often when a group of men is trying to arrive at a conclusion as to how to proceed along certain lines there is a great deal of lost motion and lack of progress, whereas with one directing head who has authority to go ahead a good deal of red tape can be eliminated and more progress made. How-

ever, a coordination of all these efforts would seem to be a wise solution of these problems as far as the gas industry is concerned. Some research work should be done by the association, some by individual companies, and possibly further research work done by groups of companies. The American Gas Association should function as a clearing house for facts developed by research. Information developed from all of this work, however, should be available to the industry as a whole because the success of any individual unit depends to a large extent upon the success of the industry at large. It is almost impossible for one organization to cover all fields and certainly by the cooperative method better results can be obtained.

A good example of an individual company carrying on research work first developed in the Laboratory is that of the Grand Rapids Gas Light Company in the application of dehydration apparatus in its plant. This process was developed by the Koppers Company in its laboratories and was first put to practical use in the plant of the Grand Rapids Company. After a year's successful operation analysis indicates that there is a very considerable improvement in distribution conditions. There is less drippage pumped, fewer frost and rust complaints and meter conditions are much better. There are undoubtedly great opportunities for saving in increasing the period of routine meter changes. Gas dehydration has been successfully applied in Great Britain and in the Technical Session at this convention Charles Cooper, a British gas engineer, is to present a paper telling of the experience in England.

Some years ago the Bureau of Standards made a very complete investigation of the efficiency of gas burners utilizing the Venturi principle of air mixing. This is a subject that should be thoroughly investigated by means of exhaustive experiments by the gas companies, not only manufacturing appliance companies but operating companies as well because with the close competition of the highly efficient electric ranges it is very necessary to secure a gas range that will get the highest rate of efficiency. In this connection it might be stated that one of the large electric companies in this country has developed a new type of electric range utilizing the radiant heat principle which is exceedingly efficient and can be sold at low cost. This is a factor that the gas industry should take cognizance of and further concentrated research work on this subject is highly desirable.

Scientists have been able to analyze and segregate most every function of the human body. They have even been able to preserve life itself in certain elements, but there is still something intangible that they have not been able to determine and segregate. In other words, the whole is greater than its parts. This result can be demonstrated in the gas industry as well. Each department may be functioning by itself in a very efficient and thorough manner. Research work may be progressing very successfully, but if all departments of the industry are not coordinating and functioning as a unit there will be a lack of harmony and lack of steady forward progress which should be forthcoming. The industry can succeed and make further progress only if the men and women engaged in it have a proper consideration of its problems, a thorough confidence and optimism in its future and an abiding faith in the search for truth which is essential if research is to be successfully applied to problems of the industry.

Research on technical matters necessarily develops new facts whereas financial matters usually are resolved into matters of judgment. However, for the greatest good of the industry it is believed that the facts developed by research must be considered from economic and commercial aspects as well. The gas business or any other business cannot be revolutionized without serious consequences and the whole problem of research must be considered in connection with the economic survey and analysis of the gas industry which has been under way for several years past. The development of absolute knowledge, if there is such a thing, is very essential to any industry but its appli-

cation must be based upon commercial and economic laws which, though at times may seem to be ignored, ultimately will govern. It is one thing to have optimistic confidence in the future of the industry and another thing to work out the practical applications of that industry which will fit in with the whole economic structure of the country. The problems now under discussion are now too broad in scope to be settled out of hand without a proper consideration of the economic factors, visualization of the future as well as facts developed by research. It is suggested that the term "economic research" will probably best cover that form of development work which the gas industry most needs today. This does not mean that everything must be sacrificed to matters of policy or economic pressure but it should mean that a proper consideration of all the factors involved should be given beforé a decision to go ahead is made, but when these factors have all been analyzed and conclusions arrived at then a decision should be made and the industry organized to go ahead on a united basis.

Some executives have viewed the general question of research somewhat along the lines of an evil which should be avoided. There is no question but that large sums of money have been wasted following up research that has no practical value. One of the chief points of the research work which has been undertaken generally by the American Gas Association is that everybody has an opportunity to study the situation thoroughly and give an opinion before the project is taken up in a definite way and money spent on it. This means that the commercial and economic aspects of the research problem are bound to be considered carefully at first because the association has a limited income to spend and as a matter of necessity must keep its program down to a reasonable basis. Rome was not built in a day, neither can the various problems which the gas industry has be solved in a year or even a number of years. The problems will never be entirely solved. There are new ones coming up every day and that is where the strength of the industry lies. If it were to become dormant there would be danger that it would retrogress instead of going ahead. The men who are doing the thinking for the industry must have new ideas to work on, for when an industry lacks new ideas it is headed for a decline. Research should come to be considered not as a necessary evil but as an effective tool in the hands of the executive to determine the facts insofar as they may be determined on which he may base his future plans. A research man can develop the facts but the executive must determine how they can be applied to the business in a way that will bring in net earnings and also give better service to the public. Research will never displace courageous judgment, but it will help to prevent mistakes.

It is suggested that there must be closer coordination in the efforts of the research man, the operating man and the man in charge of the financial side of the industry. If these men can get together around the conference table and exchange ideas, each giving proper consideration to the problems of the other, certainly more definite forward progress can be made than if each group works out its problems along separate lines. Engineers and research men have perhaps ignored the questions of finance too much in developing their problems and therefore they are apt to meet with disappointment when bringing a certain expenditure up for approval on finding that they have not given due consideration to the economic and commerical factors. If these things were all thrashed out before it would make for a more thorough understanding of the problems involved by all concerned and undoubtedly develop a broader and more effective leadership. Certainly it is far better to spend what little money is required for investigation in advance and develop the ideas on paper as far as may be, giving thorough consideration to cost, rather than to proceed blindly along on new construction, thereby possibly perpetuating mistakes and erecting monuments to incorrect principles.

One of the chief factors of the great progress in the electrical industry has been

the romance connected with it and by far the greater part of the present research is undoubtedly along the lines of radio application. It may be that there is no equivalent touch of romance in the gas industry, but no efforts should be spared to develop what there is. Refrigeration by means of gas-fired units is certainly an amazing development and it is arousing widespread interest among the general public. Romance or not, however, the economics of any given situation are bound to be considered and in industrial application the cost of production is paramount. The necessity for meeting competitive situations has caused tremendous developments in thermostatically controlled gas apparatus already and there is no question that more can and will be done along these lines.

It must be borne in mind that the industry must always be planning ahead for future developments, and of course this involves not only expenditure of money both in engineering studies and research work, but also consideration of public policy. The time is past when the various departments can work as separate units. They must work as co-ordinated members of a group and those in responsible charge of the gas industry must develop men who have broad training and experience which will enable them to give proper consideration not only to the facts developed by research but to the financial aspect and a broad and intelligent conception of public policy matters as well. It must develop men who have courage to face the future with confidence. Technical research is important but courage and vision are perhaps more so. Any industry which keeps its house in order in a way which is bound to result from such a procedure cannot help but survive. It will readjust itself to new conditions as they develop and it will always be in a position to develop new processes, not only of manufacture and distribution but of utilization as well.

Research and success are closely related. A study of the history of mankind as well as of industrial progress will show that the man or the unit of industrial organization that has achieved success is the one that has done the most original and courageous thinking. It is much easier to follow than to lead but following blind leadership is apt to be disastrous. Success has been defined in many ways, but its elements must include knowledge of the business, courage, activity and talent for human relationship, or in other words, organization. Research is closely interwoven with all these elements and certainly it is a definite part of every one of them.

Research is absolutely essential to the progress and success of any industry. It should be a fundamental part of every program of development. The growth and expansion of the immediate future are important, of course, but it is the five and even ten-year plan for the future which really makes for the ultimate success or failure of any industry.

The gas industry must be prepared to face constantly changing conditions. It is no different from any other in that respect. It must contribute to scientific development through research in theoretical applications and not so much by following the traditions of the past. The programs of research now under way are broad and far-reaching in their scope, but they are only a beginning of the programs which must be adopted if the gas industry is to take and hold its proper place among the industries of this nation.

Newspaper Comment on Smoke

(Continued from page 740)

of human beings are weakened by constantly inhaling smoke charged with sulphur and poisonous gases.'

"We can not ignore the fact that the smoke from autos on Burlington's chiefly traveled streets has augmented the smoke nuisance so far as human lungs are concerned. At times the smoke on South Union street is almost stifling for foot passengers. The ills that pedestrians suffer reach the homes to a greater or less degree.

"These and other considerations add to the reasons why the soft coal smoke from chimneys should be handled through smoke arresters or otherwise. It is not necessary to get radical over this issue. Nor should we on the other hand continue to suffer in silence. Let us insist that the smoke nuisance shall be handled effectively and with reasonable expedition."

Associations Affiliated with A. G. A.

Canadian Gas Association
Pres.—Kenneth L. Dawson, Nova Scotia Light & Power Co., Ltd., Halifax, N. S.
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.
Conv., June 24, 25, 1930, Halifax, N. S.

Colorado Utilities Association
Pres.—H. S. Robertson, Denver Tramway Corp., Denver, Colo.
Sec.-Tr.—O. A. Weller, Public Service Co. of Colo., Denver, Colo.
Conv., 1930.

Empire State Gas and Electric Association
Pres.—William J. Welsh, New York & Richmond Gas Co., Staten Island, New York.
Chairman Gas Section—R. Van Vliet, New York & Richmond Gas Co., Staten Island, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.
Conv., 1930.

Illinois Gas Association
Pres.—E. E. Lungren, Western United Gas & Electric Co., Aurora, Ill.
Sec.-Tr.—George Schwaner, 305 Illinois Mine Workers Bldg., Springfield, Ill.
Conv., 1930.

Indiana Gas Association
Pres.—C. L. Kirk, Citizens Gas Co., Indianapolis, Ind.
Sec.-Tr.—F. W. Budd, Central Indiana Gas Co., Muncie, Ind.
Conv., 1930.

Michigan Gas Association
Pres.—A. I. Snyder, Detroit City Gas Co., Detroit, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Conv., July 1 & 2, 1930, Grand Hotel, Mackinac Island, Mich.

Mid-West Gas Association
Pres.—E. H. Vieregg, Central Power Co., Grand Island, Nebr.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.
Conv., Waterloo, Iowa, Apr. 14-16, 1930.

Missouri Association of Public Utilities
Pres.—T. J. Strickler, Kansas City Gas Co., Kansas City, Mo.
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.
Conv., 1930.

New England Gas Association
Pres.—J. J. Quinn, Boston Consolidated Gas Co., Quincy, Mass.
Exec. Sec.—C. D. Williams, 41 Mount Vernon St., Boston, Mass.
Chairman Operating Div.—Isaac T. Haddock, Cambridge Gas Light Co., Cambridge, Mass.
Secretary Operating Div.—H. G. Taylor, Lawrence Gas & Electric Co., Lawrence, Mass.
Chairman Sales Div.—J. H. Sumner, Cambridge Gas Light Co., Cambridge, Mass.
Sec.-Tr. Sales Div.—A. M. Slattery, Hoffman Heater Co., Boston, Mass.
Chairman Industrial Div.—L. B. Crossman, Boston Consolidated Gas Co., Boston, Mass.
Sec.-Tr. Industrial Div.—Chas. H. O'Donnell, Boston Consolidated Gas Co., Boston, Mass.
Chairman Acctg. Div.—R. D. Washburn, Massachusetts Lighting Co., Boston, Mass.
Sec.-Treas. Acctg. Div.—Otto Price, Boston Consolidated Gas Co., Boston, Mass.
Chairman Manufacturer Div.—T. H. Piser, Welsbach Co., Boston, Mass.
Sec.-Treas. Manufacturers Div.—J. H. McPherson, 250 Stuart St., Boston, Mass.
Conv., Feb. 19 & 21, 1930, Hotel Statler, Boston, Mass.

New Jersey Gas Association
Pres.—R. A. Koehler, Public Service Electric & Gas Co., Newark, N. J.
Sec.-Tr.—H. E. Cliff, Public Service Electric & Gas Co., Newark, N. J.
Conv., 1930.

Ohio Gas and Oil Men's Association
Pres.—L. K. Langdon, Union Gas & Electric Co., Cincinnati, Ohio.
Sec.-Tr.—Wm. H. Thompson, 811 First National Bank Bldg., Columbus, Ohio.
Conv., 1930.

Oklahoma Utilities Association
Pres.—T. R. Weymouth, Oklahoma Natural Gas Corp., Tulsa, Okla.
Mgr.—E. F. McKay, 1020 Petroleum Bldg., Oklahoma City, Okla.
Conv., March, 1930, Tulsa, Okla.

Pacific Coast Gas Association
Pres.—F. H. Bivens, Southern Counties Gas Co., Los Angeles, Calif.
Mang. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.
Conv., 1930.

Pennsylvania Gas Association
Pres.—W. A. Norris, Lebanon Valley Gas Co., Lebanon, Pa.
Sec.-Tr.—Frank W. Lesley, Pennsylvania Gas & Electric Co., York, Pa.
Conv., Apr. 29, 30 & May, 1, 1930, Wernersville, Pa.

Pennsylvania Natural Gas Men's Association
Pres.—Geo. E. Whitwell, Equitable Gas Co., Pittsburgh, Pa.
Sec.-Tr.—B. H. Smyers, Jr., 435 Sixth Ave., Pittsburgh, Pa.
Conv., 1930.

Southern Gas Association
Pres.—D. H. Levan, Jacksonville Gas Co., Jacksonville, Fla.
Sec.-Tr.—G. H. Schlatter, Birmingham Gas Co., Birmingham, Ala.
Conv., April 22, 23, 24, 1930, Savannah, Ga.

Southwestern Public Service Association
Pres.—Knox Lee, Southwestern Gas & Electric Co., Marshall, Texas.
Chairman Gas Section—Frank L. Chase, Lone Star Gas Co., Dallas, Texas.
Sec.—E. N. Willis, 403 Slaughter Bldg., Dallas, Texas.
No Convention, 1929.

The Public Utilities Association of Virginia
Pres.—A. W. Higgins, Virginia Public Service Co., Charlottesville, Va.
Sec.—A. B. Tunis, 301 East Grace St., Richmond, Va.
Conv., 1930.

Wisconsin Utilities Association
Pres.—G. W. Van Derzee, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.
Exec. Sec.—J. N. Cadby, 105 Wells St., Milwaukee, Wis.
Meetings of Sections.

Twelfth Annual Convention of the American Gas Association
Atlantic City, N. J. October 13-17, 1930

Employment Bureau

(Address All Communications to Key Number)

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OLD ESTABLISHED MANUFACTURER of small gas appliance accessories located in the Middle West has opening for man with creative or inventive ability for the design and development of new devices. State age, education, experience and salary desired in first letter. Address A. G. A.
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LARGE EASTERN UTILITY (New York State)—desires a few recent technical graduates to specialize in gas engineering. Applicants should give full particulars as to education, experience, references, etc. Address A. G. A.
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Key No. 0158.

ENGINEER WANTED—A large utility in the South has an opening for a good man, in the Industrial Department. He should have some technical education and some experience, not necessarily in gas. Give all details. Address A. G. A.
Key No. 0159.

WANTED—Assistant to executive, thoroughly experienced engineer-salesman, capable as organizer and competent to analyze and develop house heating, industrial applications and appliance sales. Prefer single man although not essential. Must be firm believer in stability of gas industry, energetic and of unquestioned integrity. Must be able to submit record of achievement. Address A. G. A.
Key No. 0160.

EXPERIENCED COST analyst capable of independent work in development of costs and rates for a Middle West gas and electric utility. Applicant should give resume of education and experience, salary desired and include a recent photograph. Address A. G. A.
Key No. 0161.

SERVICES OFFERED

GAS ENGINEER, college education, with 12 years experience, first four years with Coal Gas & Electric Co., last eight years as manager of small Water Gas Co., desires position as manager or assistant manager of a gas or combination company. Address A. G. A.
Key No. 285.

YOUNG LADY with twelve years' experience in coke oven and gas business, desires secretarial position, New York City preferred. Address A. G. A.
Key No. 291.

AVAILABLE, a man who has been employed through a continuous period of years in nearly all branches of the gas business. General office to superintendent of manufacture and distribution, including both coal and water gas. Would like to make a similar connection or one of general supervision. Address A. G. A.
Key No. 293

POSITION WANTED—Technical man now employed desires new location. Eight years' experience in distribution and transmission of natural and manufactured gas. Is able to organize and direct large crews. Also experienced in leakage surveys and appraisal work. Address A. G. A.
Key No. 294.

WANTED—Position as assistant to engineer of distribution by young man with four and one-half years' experience in Distribution Department of large corporation. 22 years old. Single. Willing to travel. Good references. Address A. G. A.
Key No. 296.

CERTIFIED Public Accountant (N. Y.) five years' gas and electric rate case and accounting experience, university graduate, age 30, immediately available. Address A. G. A.
Key No. 298.

A TECHNICALLY EDUCATED GAS ENGINEER, now employed, with 15 years' experience in Coal and Water Gas Operation, Distribution and Industrial Sales, desires new connection. Address A. G. A.
Key No. 299.

ENGINEER, technically educated, with wide experience in steam engineering, operation and five years Superintendent of Customer's Service Department of a large gas company. Desires connection preferably where both experiences can be used to advantage. Address A. G. A.
Key No. 302.

AVAILABLE, New Business and Commercial Manager. Age 30, married. Has successful record merchandising gas appliances, house heating, etc., with Public Utility. Desires position in Commercial Field. Technical education and familiar with Engineering problems and Office routine. Good executive. Address A. G. A.
Key No. 303.

POSITION WANTED—Meter Foreman desires position with gas company. Experienced in all makes of meters. Best of references to character and ability. Address A. G. A.
Key No. 305.

GAS ENGINEER, college education, six years' experience in gas distribution, both H.P. M.P. and low pressure, and water-gas manufacturing from 3,000 M per day plant to 15,000 M per day plant, and general gas company construction, desires engineering position as manager, assistant manager, or superintendent. Address A. G. A.
Key No. 306.

EXECUTIVE, able to qualify as manager would like to make change. Address A. G. A.
Kev No. 307.

AVAILABLE, New Business and Commercial Manager or Supervisor. Age 35, married. Has successful record merchandising gas appliances, house heating, etc., with Public Utility. Desires position in Commercial Field. Technical education and familiar with Engineering problems and Office routine. Good executive. Address A. G. A.
Key No. 308.

POSITION WANTED—Commercial manager for 10 years of large Southern company with 8000 meters desires new connection. Is 53 years old. Experienced in industrial work and hotel and restaurant business, as well as advertising and general duties of commercial manager. Speaks Spanish. Good references. Address A. G. A.
Key No. 309.

UTILITY EXECUTIVE AVAILABLE—Public Utility Executive available as President or Vice-President of holding company or operating company, or as Utility Adviser to Bank, Investment Trust, Brokerage or Investment House. Have had twenty years' experience in all branches of Utility business, including organization, financing, construction, operation, public relations and sales. Gas, natural and manufactured, electricity, ice, heat, water, merchandise and securities. Address A. G. A.
Key No. 310.

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